AGREEMENT

THIS AGREEMENT is hereby made and entered into this 28 day of Feb., 2023, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WHEREAS, section 163.340(9), Florida Statutes states:
'Community redevelopment' or 'redevelopment' means undertakings, activities, or projects of a county, municipality, or community redevelopment agency in a community redevelopment area for the elimination and prevention of the development or spread of slums and blight, or for the reduction or prevention of crime, or for the provision of affordable housing, whether for rent or for sale, to residents of low or moderate income, including the elderly, and may include slum clearance and redevelopment in a community redevelopment area or rehabilitation and revitalization of coastal resort and tourist areas that are deteriorating and economically distressed, or rehabilitation or conservation in a community redevelopment area, or any combination or part thereof, in accordance with a community redevelopment plan and may include the preparation of such a plan; and

WHEREAS, the Delray Beach CRA Redevelopment Plan ("Redevelopment Plan"), Part Four, Section II(B)(#2.1), pp. 72-73, provides numerous objectives of the CRA which include elimination of blighted conditions along SW/NW 5th Avenue, encouragement of minority business development, providing a catalyst for future development on adjoining blocks of West Atlantic and further minority business development, creating and maintaining a safe and lively pedestrian-friendly corridor, providing diverse neighborhood shopping, services, and cultural facilities for area residents and businesses, creation of jobs, and promotion of the area as a neighborhood commercial center, containing goods and services intended to serve the surrounding neighborhood as well as appeal to a larger market outside the area; and

WHEREAS, the CRA desires to retain the services of the Contractor to provide the goods and services in accordance with the CRA's Invitation to Bid No. 2022-01-R, and the Contractor's response thereto, all of which are incorporated herein by reference.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereafter set forth, the Contractor and the CRA agree as follows:

ARTICLE 1. INCORPORATION OF INVITATION TO BID

The terms and conditions of this Agreement shall include and incorporate the terms, conditions, and specifications set forth in the CRA's Invitation to Bid No. 2022-01-R and addendums, and the Contractor's response to the Invitation to Bid, including all documentation required thereunder (collectively referred to as "Project"), herein attached as **Exhibit "A"**.

ARTICLE 2. DESCRIPTION OF GOODS OR SCOPE OF SERVICES

The Contractor shall provide the goods and/or perform those services identified in the specifications accompanying the CRA's Invitation to Bid, which are incorporated herein by reference.

ARTICLE 3. COMPENSATION

The CRA shall pay to the Contractor, in compliance with the Schedule of Values attached hereto as **Exhibit "B"** and incorporated herein, according to the terms and specifications of the referenced Invitation to Bid, in an amount not to exceed **Two Million Seven Hundred Thirty-Nine Thousand Nine Hundred Sixty-Eight and 00/100 Dollars ($2,739,968.00)**.

ARTICLE 4. MISCELLANEOUS PROVISIONS

a. Notice Format. All notices or other written communications required, contemplated, or permitted under this Agreement shall be in writing and shall be hand delivered, telecommunicated, or mailed by registered or certified mail (postage prepaid), return receipt requested, to the following addresses:

As to the CRA: Renée A, Jadusingh, Executive Director
20 N. Swinton Avenue
Delray Beach, Florida 33444
Phone # 561-276-8640
Email copy to: Kim N. Phan, Esq., Legal Advisor
kimp@mydelraybeach.com

As to the Contractor: Richard C. Ahrens
Ahrens Enterprises, Inc. dba AHRENS Companies
1461 Kinetic Road
Lake Park, FL 33403
Phone # 561-839-2820
Email: richard@ahrenscompanies.com

Notices given by courier service or by hand delivery shall be effective upon delivery and notices given by mail shall be effective on the third (3rd) business day after mailing. Refusal by any person to accept delivery of any notice delivered to the office at the address indicated above (or as it may be changed) shall be deemed to have been an effective delivery as provided in this Section. The addresses to which notices are to be sent may be changed from time to time by written notice delivered to the other parties and such notices shall be effective upon receipt. Until notice of change of address is received as to any particular party hereto, all other parties may rely upon the last address given.

b. Headings. The headings contained in this Agreement are for convenience of reference only, and shall not limit or otherwise affect in any way the meaning or interpretation of this Agreement.

c. Effective Date. The effective date of this Agreement shall be as of the date it has been executed by both the parties hereto.

ARTICLE 5. CONTRACT TERM

The Contractor agrees to complete the Project within the timeframe designated by the CRA. The Contractor shall agree to complete the Project no later than 365 calendar days after the Notice to Proceed is issued. The CRA, at its discretion, may allow for time extensions for unforeseen and unexpected delays.

IN WITNESS WHEREOF, the parties have executed this Agreement on the dates hereinafter written.

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

By: Shirley Ervin Johnson, Chair

ATTEST:

By: _____
Renée A. Jadusingh, CRA Executive Director

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY

By: _____
Kim N. Phan, Legal Advisor

AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES, a Florida Corporation

[SEAL]

By: Richard C. Ahrens

Printed Name: Richard C. Ahrens

Title: President/CEO

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization, this 28th day of February, 2023, by Sheri Williams (name of person), as Notary (type of authority) for Richard C. Ahrens (name of party on behalf of whom instrument was executed).

Personally known ___ OR Produced Identification
Type of Identification Produced N/A

SHERI M. WILLIAMS
Commission # HH 188194
Expires August 23, 2025
Bonded Thru Budget Notary Services

Sheri M Williams
Notary Public – State of Florida

EXHIBIT A

ITB CRA No. 2022-01-R Bid Documents

ITB CRA No. 2022-01-R Addenda

Technical Specifications – 95 SW 5th Avenue

Construction Drawings – 95 SW 5th Avenue

DELRAY BEAC
COMMUNITY REDEVELOPMENT AGENCY CRA

INVITATION TO BID ITB
CRA NO. 2022-01

95 SW 5□□ AVENUE
COMMERCIAL BUILDING CONSTRUCTION

ISSUE DATE
S□□□□□ □□□6, 2022

VOLUNTARY PRE-BID MEETING
S□□□□□ □□□15, 2022
10 00AM EST

QUESTION SUBMITTAL DEADLINE
S□□□□□ □□□22, 2022
5 00PM EST

BID SUBMISSION DUE DATE AND TIME
O□□□□□□21, 2022
2 00PM EST

CONTACT

IVAN CABRERA, AICP, REDEVELOPMENT MANAGER
DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY
20 NORTH SWINTON AVENUE
DELRAY BEACH, FL 33444
Cabrerai mydelraybeach.com
561-276-8640

INSTRUCTIONS

Sealed Bids must be received on or before the Bid Submission Due Date and Time. Bids shall be submitted in accordance with the instructions contained herein. All Bids will be publicly opened at the CRA Office, located at 20 N. Swinton Avenue, Delray Beach, Florida, 33444, immediately after the Bid Submission Due Date and Time, unless otherwise specified.

Bids shall be submitted in hard copy format only and may be mailed or hand delivered, to the CRA Office, located at 20 N. Swinton Avenue, Delray Beach, Florida, 33444, **and** must be received by the CRA on or before the Bid Submission Due Date and Time indicated in this ITB. Normal business hours are 8:00 AM to 5:00 PM, Monday through Friday, except holidays. Hard copy Bid packages shall have the following information clearly marked on the face of the sealed package: Bidder's name, return address, ITB number, Bid Submission Due Date, and the title of the Bid. Included in the Bid package shall be one (1) hard copy of the Bid clearly identified as the "Original" that includes signed originals of all required forms and one (1) electronic version of the Bid on a Universal Serial Bus (USB) drive in searchable and legible PDF format.

It is the sole responsibility of the Bidder to ensure its Bid submission is complete prior to the Bid Submission Due Date and Time. Electronic submission of Bids will not be accepted.

Bids must contain all information, forms, and authorized signatures, as described in this Bid Solicitation. If the required information, form, or signature is not included, the Delray Beach Community Redevelopment Agency ("CRA") may deem the Bid non-responsive.

BROADCAST

The CRA utilizes electronic online services for notification and distribution of its Bid Solicitation documents. The CRA's Bid Solicitation information can be obtained from: (a) the Delray Beach Community Redevelopment Agency, www.delraycra.org; and (b) the BidSync website – www.bidsync.com.

Bidders who obtain Bid Solicitation documents and/or information related to the Bid Solicitation from sources other than those named above are cautioned that they should not rely on any representations, statements, or explanations other than those made in this Invitation to Bid ("ITB") and in any written addendum to this ITB. Oral explanations, information, and instructions shall not be considered binding on the CRA. Neither the CRA nor any of its agents or employees shall be responsible for the accuracy of any oral information provided to any Bidder. The CRA may deem incomplete Bids as non-responsive and the CRA will not evaluate or consider non-responsive Bids. BidSync is an independent entity and is not an agent or representative of the CRA. Communications to BidSync do not constitute communications to the CRA.

CONTACT PERSON

Any questions regarding the terms, conditions, specifications, requests for clarification and/or additional information, and questions related to the Bid Solicitation process must be submitted in writing to Ivan Cabrera, AICP, CRA Redevelopment Manager, at cabrerai@mydelraybeach.com and must be received prior to the Question Submittal Deadline of September 22, 2022 at 5:00pm EST.

The Delray Beach Community Redevelopment Agency
20 North Swinton Avenue
Delray Beach, FL 33444

LEGAL ADVERTISEMENT

INVITATION TO BID CRA NO.: 2022-01
95 SW 5TH AVENUE COMMERCIAL BUILDING CONSTRUCTION
BID SUBMISSION DUE DATE AND TIME: FRIDAY, OCTOBER 21, 2022 AT 2:00 PM EST

The Delray Beach Community Redevelopment Agency ("CRA") is seeking Bids from qualified Bidders to construct a commercial building to be located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, in accordance with the terms, conditions, and specifications contained in the Invitation to Bid (ITB).

The ITB documents are available beginning Tuesday, September 6, 2022, on (a) the Delray Beach Community Redevelopment Agency website - www.delraycra.org and on (b) the Bid Sync website – www.bidsync.com.

Mailed or hand-delivered hard copies of sealed Bids will be accepted at the CRA Office, located at 20 N Swinton Avenue, Delray Beach, Florida, 33444, before or until the Bid Submission Due Date and Time. Submission of Bids electronically will not be accepted. Bid packages shall have the following information clearly marked on the outside of the sealed package: Bidder's name, return address, ITB number, Bid Submission Due Date, and the title of the Bid. Bids will be publicly opened and read aloud at the CRA Office immediately after the Bid Submission Due Date and Time. The CRA will not be responsible for and will not accept any late, delayed, misdelivered, or nondelivered Bids. Bids arriving after the Bid Submission Due Date and Time will not be accepted and will be returned to the sender unopened**.**

The CRA will hold a Voluntary Pre-Bid Meeting on Thursday, September 15, 2022, starting promptly at 10:00 a.m. EST, at the Arts Warehouse, located at 313 NE 3rd Street, Delray Beach, Florida, 33444.

It is the responsibility of the Bidder to ensure all required information is included in their Bid submission. All Bidders are advised to closely examine the ITB documents. Any questions regarding the completeness or substance of the ITB documents or scope of work must be submitted in writing via email to Ivan Cabrera, AICP, CRA Redevelopment Manager, at cabrerai@mydelraybeach.com, by the Question Submittal Deadline of Thursday, September 22, 2022 at 5:00 p.m. EST.

The CRA is exempt from Federal and State Taxes for tangible personal property tax.

The CRA reserves the right to accept or reject any or all Bid(s), in whole or in part, with or without cause without any liability to the CRA. The CRA does not warranty or represent that any award or recommendation will be made as a result of the issuance of this Legal Advertisement or the ITB, or receipt of a Bid(s). The CRA and Bidder will be bound only if and when a Bid, as it may be modified, is approved and accepted by the CRA, and the applicable agreements pertaining thereto are approved, executed, and delivered by the Bidder to the CRA, and then only pursuant to the terms of the agreements executed by the Bidder and the CRA.

Table of Contents

SECTION 1: GENERAL TERMS AND CONDITIONS 5
SECTION 2: SPECIAL TERMS AND CONDITIONS 19
SECTION 3: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS 30
SECTION 4: MINIMUM QUALIFICATIONS 32
SECTION 5: BID FORMS AND AFFIDAVITS 34
SECTION 6: EXHIBITS 49

SECTION 1: GENERAL TERMS AND CONDITIONS

1. DEFINITIONS

a. Architect of Record: person and/or firm developing the design and preparing the signed and sealed construction drawings for the project.

b. Awarded Bidder: Bidder who is awarded a contract to provide goods or services to the CRA.

c. Bid: any offer(s) submitted in response to an Invitation to Bid.

d. Bidder: person or firm submitting a Bid in response to an Invitation to Bid.

e. Bid Solicitation or ITB: this Invitation to Bid, including all documentation and any and all addenda.

f. CRA: shall refer to the Delray Beach Community Redevelopment Agency.

g. Contract or Agreement: Invitation to Bid, all addenda issued thereto, all affidavits, the signed agreement, and all related documents which comprise the totality of the contract or agreement between the CRA and the Bidder.

h. Contractor: Awarded Bidder who executes a Contract with the CRA to provide the necessary goods or services.

i. Invitation to Bid: this formal Solicitation requesting Bids from all interested qualified Bidders.

j. Responsible Bidder: Bidder which has the capability in all respects to perform in full the contract requirements, as stated in the Invitation to Bid, and the integrity and reliability that will assure good-faith performance.

k. Responsive Bidder: Bidder whose Bid conforms in all material respects to the terms, conditions, and specifications included in the Invitation to Bid.

l. Solicitation Summary Form: describes the goods or services to be purchased and the price, and must be completed by the Authorized Agent of the Bidder and submitted with the Bid.

2. CONE OF SILENCE/NO LOBBYING

Pursuant to Section 2-355 of Palm Beach County Ordinance No. 2011-039, and the purchasing policies of the CRA, all solicitations, once advertised and until the appropriate authority approves an award recommendation, are under the "Cone of Silence". This limits and requires documentation of communications between potential Bidders and/or Bidders, the CRA Staff, and the CRA Board Members, amongst other parties.

As to any matter relating to this ITB, any Bidder, Bidder's team member, or anyone representing a Bidder is advised that they are prohibited from contacting or lobbying the CRA Chair, any CRA Board Member, CRA Staff, or any other person working on behalf of the CRA on any matter related to or involved with this ITB. For purposes of clarification, a Bidder's representatives shall

include, but not be limited to, the Bidder's employees, partners, attorneys, officers, directors, consultants, lobbyists, any actual or potential subcontractor or consultant of the Bidder, or any member of the Bidder's team. If a Pre-Bid Meeting is scheduled, there will be an opportunity for inquiries to be made of CRA Staff during the scheduled Pre-Bid Meeting. All inquiries made outside of the Pre-Bid Meeting must be in writing and directed to Ivan Cabrera, AICP, CRA Redevelopment Manager, at (cabrerai@mydelraybeach.com.**)** Any violation of this condition may result in rejection of a submitted Bid and/or disqualification of the Bidder. This "Cone of Silence/No Lobbying" is in effect from the date of issuance of the ITB and shall terminate at the time the CRA Board selects a Bid, rejects all submitted Bids, or otherwise takes action which ends the Bid Solicitation process.

3. ADDENDUM

The CRA may issue an addendum in response to any inquiry received, prior to the close of the solicitation period, which changes, adds, or clarifies the terms, specifications, conditions, provisions, or requirements of the ITB. The Bidder should not rely on any representation, statement, or explanation, whether written or verbal, other than those made in the ITB documents or in the addenda issued. Where there appears to be a conflict between the ITB documents and any addenda, the last addendum issued shall prevail. It is the Bidder's responsibility to ensure receipt of all addenda, and any accompanying documentation. The Bidder is required to submit with its Bid a signed "Acknowledgment of Addenda" form when any addenda have been issued.

4. LEGAL REQUIREMENTS

This ITB is subject to all legal requirements contained in the applicable City Ordinances, Resolutions, and CRA Policies, as well as all applicable State and Federal Statutes. Where conflict exists between this ITB and these legal requirements, the authority shall prevail in the following order: Federal, State, and local.

5. CHANGE OF BID

Prior to the scheduled Bid opening a Bidder may change its previously submitted Bid by submitting a new Bid with a written letter on the Bidder's letterhead, signed by an authorized agent of the Bidder, duly notarized, and submitted to the CRA Office located at 20 N Swinton Avenue, Delray Beach, Florida, 33444, stating that the new Bid submittal replaces the original Bid submittal. The new Bid submittal shall contain the letter and all information as required for submitting a Bid. No oral modifications to a submitted Bid will be allowed. Modifications shall not be allowed after the Bid Submission Due Date and Time.

6. WITHDRAWAL OF BID

A Bid shall be irrevocable unless the Bid is withdrawn as provided herein. Only a written letter received by the CRA prior to the scheduled Bid opening may withdraw a Bid. The withdrawal letter must be on the firm's letterhead, signed by an authorized agent of the Bidder, duly notarized, and delivered to the CRA Office located at 20 N Swinton Avenue, Delray Beach, Florida, 33444, stating that the Bid is being formally withdrawn. No oral modifications or withdrawals of a submitted Bid will be allowed.

7. CONFLICTS WITHIN THE BID SOLICITATION

Where there appears to be a conflict between the General Terms and Conditions, Special Conditions, the Technical Specifications, the Solicitation Summary Form, or any addendum

issued, the order of precedence shall be: the last addendum issued, the Solicitation Summary Form, the Technical Specifications, the Special Conditions, and then the General Terms and Conditions.

8. PROMPT PAYMENT TERMS

It is the policy of the CRA that payment for all purchases by the CRA shall be made in a timely manner. The CRA will pay the Contractor upon receipt and acceptance of the goods or services by a duly authorized representative of the CRA. In accordance with Section 218.74, Florida Statutes, the time at which payment shall be due from the CRA shall be forty-five (45) days from receipt of a proper invoice. The time at which payment shall be due to small businesses shall be thirty (30) days from receipt of a proper invoice. Proceedings to resolve disputes for payment of obligations shall be concluded by final written decision of the CRA, not later than sixty (60) days after the date on which the proper invoice was received by the CRA.

9. PREPARATION OF BIDS

a. The required Bid forms contained herein must be completed and submitted with the Bid. Use of any other forms or changes to the forms will result in the rejection of the Bid. All forms must be legible. Bidders shall use typewriter, computer, or ink to complete the forms. Incomplete or illegible forms may cause the Bid to be rejected.

b. An authorized agent of the Bidder's firm must sign all required forms where indicated. **Failure to sign any of the required forms shall render the Bid non-responsive.**

c. The Bidder may be considered non-responsive if Bids are conditioned upon modifications, changes, or revisions to the terms and conditions of this Bid Solicitation.

d. When there is a discrepancy between the unit prices and any extended prices, the unit prices will prevail.

e. Late Bids will not be accepted and will be returned to the sender unopened. It is the Bidder's responsibility to ensure timely receipt of the Bid by the CRA by the Bid Submission Due Date and Time, and at the place stated in this Bid Solicitation. No exceptions will be made due to non-delivery, weather, carrier, traffic, illness, or other issues.

10. CANCELLATION OF BID SOLICITATION

The CRA reserves the right to cancel, in whole or in part, this ITB when it is in the best interest of the CRA which shall be determined at the sole and absolute discretion of the CRA.

11. AWARD OF CONTRACT

a. The Contract may be awarded to the responsive and responsible Bidder meeting all requirements as set forth in the Bid Solicitation, and in the best interest of the CRA. The CRA shall be the sole and absolute judge of its best interest.

b. The CRA reserves the right to reject any and all Bids if it is determined that prices are excessive, best offers are determined to be unreasonable, or it is otherwise determined to be in the CRA's best interest to do so.

c. The CRA reserves the right to negotiate prices **with the responsive and responsible Awarded Bidder**, provided that the scope of work of this ITB remains the same.

d. The Bidder's performance as a prime contractor or subcontractor on previous CRA contracts shall be taken into account in evaluating the Bid received for this ITB.

e. The CRA will provide a copy of the Bid Tabulation to all Bidders responding to this ITB.

f. The ITB, any addenda and/or properly executed modifications, the signed Contract, the purchase order, and any change order(s) shall constitute the Contract.

g. Award of this Bid may be predicated on compliance with and submittal of all required documents and forms as stipulated in this ITB.

h. The CRA reserves the right to request and evaluate additional information from any Bidder after the Bid Submission Due Date and Time as the CRA deems necessary.

i. The CRA reserves the right to accept or reject any or all Bid(s), in whole or in part, with or without cause without any liability to the CRA. The CRA does not warranty or represent that any award or recommendation will be made as a result of the issuance of this ITB or receipt of a Bid. The CRA and the Bidder will be bound only if and when a Bid, as it may be modified, is approved and accepted by the CRA, and the applicable Contract(s) pertaining thereto are approved, executed and delivered by the proposer to the CRA, and then only pursuant to the terms of the Contract(s) executed by the Contractor and the CRA.

12. CONTRACT EXTENSION

The CRA reserves the right to automatically extend any Contract for a maximum period not to exceed one hundred and eighty (180) calendar days in order to provide the CRA with continual service and supplies while a new contract is being solicited, evaluated, and/or awarded.

13. WARRANTY

All warranties express and implied shall be made available to the CRA for goods and services covered by this ITB. All goods furnished shall be fully guaranteed by the Contractor against factory defects and workmanship. At no expense to the CRA, the Contractor shall correct any and all apparent and latent defects that may occur within the manufacturer's standard warranty.

14. ESTIMATED QUANTITIES

Estimated quantities or dollars are for Bidder's guidance only: (a) estimates are based on the CRA's anticipated needs and/or usage; and (b) the CRA may use these estimates to determine the low Bidder. No guarantee is expressed or implied as to quantities or dollars that will be used during the contract period. The CRA is not obligated to place any order for the given amount subsequent to the award of this Bid Solicitation.

15. NON-EXCLUSIVITY

It is the intent of the CRA to enter into a Contract with the Awarded Bidder that will satisfy its needs as described herein. However, the CRA reserves the right as deemed in its best interest to perform, or cause to be performed, the work and services, or any portion thereof, herein

described in any manner it sees fit, including but not limited to, award of other contracts, use of any contractor, or perform the work with its own employees.

16. CONTINUATION OF WORK

Any work that commences prior to and will extend beyond the expiration date of the current Contract period shall, unless terminated by mutual written agreement between the CRA and the Awarded Bidder, continue until completion at the same prices, terms, and conditions.

17. BID PROTEST

A Bidder that has submitted a response to this ITB and is adversely affected by the decision to award, may file a formal written protest through filing a type-written protest with the CRA office. The Bidder shall file its type-written protest with the CRA, delivered to the CRA Executive Director, at 20 N Swinton Avenue, Delray Beach, Florida, 33444, Monday through Friday, between the hours of 8:00 AM EST and 5:00 PM EST, excluding legal holidays. Bid Protests shall not be accepted through email. Protests shall contain the name, address, and phone number of the petitioner, name of the petitioner's representative (if any), and the title and number of the solicitation. Additionally, the protest shall be signed by an authorized agent of the Bidder and notarized. The protest shall specifically describe the subject matter, facts giving rise to the protest, and the action requested from the CRA. The protest shall be limited to 15 type-written pages. A written protest shall not challenge the specifications, scope of work, relative weight of evaluation criteria, a formula for assigning points, any request for additional information from Bidders, to reject insufficient and unclear Bids, ranking of Bids, to negotiate a contract, to abandon negotiations, and to approve a contract.

The written protest must be received within three (3) business days from the time of initial posting of the intended award. Notice of Intent to Award shall be posted on the CRA's website, www.delraycra.org, and on BidSync, www.bidsync.com. Failure to file a timely formal written protest within the time period specified shall constitute a waiver by the Bidder of all rights of protest.

The letter of protest shall be accompanied by a non-refundable protest application fee in an amount equal to one percent (1%) of the protestor's Bid or five thousand dollars ($5,000), whichever is less. The protest application fee must be a cashier's check, a certified check, or an attorney's trust account check made payable to the Delray Beach Community Redevelopment Agency. Failure to provide the required protest application fee shall deem the protest as incomplete and invalid.

18. LAWS AND REGULATIONS

The Contractor shall comply with all laws and regulations applicable to provide the goods or services specified in this Bid Solicitation. Bidders shall be familiar with all Federal, State, and local laws that may affect the goods and/or services offered.

19. LICENSES, PERMITS AND FEES

The Contractor shall hold all licenses and/or certifications, obtain and pay for all permits and/or inspections (if applicable), and comply with all laws, ordinances, regulations, and building code requirements applicable to the work required herein. Damages, penalties, and/or fines imposed on the CRA or the Contractor for failure to obtain and maintain required licenses, certifications, permits, and/or inspections shall be borne by the Contractor. If the Awarded Bidder does not

hold a City of Delray Beach Business Tax Receipt at the time of award, the Awarded Bidder must obtain the necessary Business Tax Receipt prior to finalizing the Contract.

20. SUBCONTRACTING

Unless otherwise specified in this Bid Solicitation, the Contractor shall not subcontract any portion of the work without the prior written consent of the CRA. The ability to subcontract may be further limited by the Special Conditions. Subcontracting without the prior written consent of the CRA may result in termination of the Contract for default.

21. ASSIGNMENT

The Contractor shall not assign, transfer, hypothecate, or otherwise dispose of this Contract, including any rights, title, or interest therein, or its power to execute such contract to any person, company, or corporation without the prior written consent of the CRA. Assignment without the prior written consent of the CRA may result in termination of the Contract for default.

22. SHIPPING TERMS

Unless otherwise specified in the Bid Solicitation, prices quoted shall be F.O.B. Destination. Freight shall be included in the proposed price.

23. RESPONSIBILITIES AS EMPLOYER

The employee(s) of the Contractor shall be considered to be at all times its employee(s), and not an employee(s) or agent(s) of the CRA. The Contractor shall provide physically competent employee(s) capable of performing the scope of work as required. The CRA may require the Contractor to remove any employee it deems unacceptable. All employees of the Contractor shall wear proper safety equipment and proper identification.

It is the Contractor's responsibility to ensure that all its employees and subcontractors comply with the employment regulations required by the US Department of Homeland Security. The CRA shall have no responsibility to check or verify the legal immigration status of any employee of the Contractor

24. INDEMNIFICATION

Contractor shall at all times hereafter indemnify, hold harmless and, at the CRA Executive Director's option, defend or pay for an attorney selected by the CRA Executive Director to defend the CRA, its officers, agents, servants, and employees from and against any and all causes of action, demands, claims, losses, liabilities, and expenditures of any kind, including attorney fees, court costs, and expenses, caused or alleged to be caused by any intentional, negligent, or reckless act of, or omission of, Contractor, its employees, agents, servants, or officers, or accruing, resulting from, or related to the subject matter of this Agreement, including, without limitation, any and all claims, losses, liabilities, expenditures, demands, or causes of action of any nature whatsoever resulting from injuries or damages sustained by any person or property. In the event any lawsuit or other proceeding is brought against the CRA by reason of any such claim, cause of action, or demand, Contractor shall, upon written notice from CRA, resist and defend such lawsuit or proceeding by counsel satisfactory to the CRA or, at CRA's option, pay for an attorney selected by the CRA Executive Director to defend the CRA. The obligations of this section shall survive the expiration or earlier termination of this Agreement.

25. COLLUSION

Bidder certifies that its Bid is made without prior understanding, agreement, relation or connection with any other corporation, firm or person submitting a Bid for the same materials, services, supplies, or equipment and is in all respects fair and without collusion or fraud. Any such violation may result in Agreement cancellation, return of materials or discontinuation of services and the possible removal of Bidder from participation in future CRA solicitations for a specified period.

The Bidder(s) attests that the Bid is genuine and not a sham or collusive or made in the interest or on behalf of any person not therein named, and that the Bidder has not, directly or indirectly, induced or solicited any other Bidder to put in a sham Bid, or any other person, firm, or corporation to refrain from proposing, and that the Bidder has not in any manner sought by collusion to secure to the Bidder an advantage over any other Bidder.

26. MODIFICATION OF CONTRACT

The Contract may be modified by mutual consent, in writing, through an amendment to the Contract, a supplemental agreement, purchase order, or change order, as appropriate. The CRA's Executive Director may further approve and amend the Contract by executing a written agreement signed by both parties.

27. TERMINATION FOR CONVENIENCE

The CRA, at its sole and absolute discretion, reserves the right to terminate any Contract entered into pursuant to this ITB with or without cause immediately upon providing written notice to the Contractor. Upon receipt of such notice, the Contractor shall not incur any additional costs under the Contract. The CRA shall be liable only for reasonable costs incurred by the Contractor prior to the date of the notice of termination. The CRA shall be the sole judge of "reasonable costs."

28. TERMINATION FOR DEFAULT

The CRA reserves the right to terminate the Contract, in part or in whole, or place the Contractor on probation in the event the Contractor fails to perform in accordance with the terms and conditions stated herein by providing written notice of such failure or default and by specifying a reasonable time period within which the Contractor must cure any such failure to perform or default. If the Contractor fails to cure the default within the time specified, the CRA may then terminate the subject Contract by providing written notice to the Contractor. The CRA further reserves the right to suspend or debar the Contractor in accordance with the appropriate CRA ordinances, resolutions, and/or policies. The Contractor will be notified by letter of the CRA's intent to terminate. In the event of termination for default, the CRA may procure the required goods and/or services from any source and use any method deemed in its best interest. All re-procurement costs shall be borne by the incumbent Bidder.

29. FRAUD AND MISREPRESENTATION

Any individual, corporation, or other entity that attempts to meet its contractual obligations with the CRA through fraud, misrepresentation, or material misstatement, may be debarred for up to five (5) years. The CRA, as a further sanction, may terminate or cancel any other contracts with such individual, corporation, or entity. Such individual or entity shall be responsible for all direct or indirect costs associated with termination or cancellation, including attorney's fees.

30. ACCESS AND AUDIT OF RECORDS

The CRA reserves the right to require the Contractor to submit to an audit by an auditor of the CRA's choosing at the Contractor's expense. The Contractor shall provide access to all of its records, which relate directly or indirectly to the Contract, at its place of business during regular business hours. The Contractor shall retain all records pertaining to this Contract, and upon request, make them available to the CRA for three (3) years following expiration of the Contract. The Contractor agrees to provide such assistance as may be necessary to facilitate the review or audit by the CRA to ensure compliance with applicable accounting and financial standards.

31. PRE-AWARD INSPECTION

The CRA may conduct a pre-award inspection of the Bidder's site or hold a pre-award qualification hearing to determine if the Bidder is capable of performing the requirements of this Bid Solicitation.

32. PROPRIETARY AND/OR CONFIDENTIAL INFORMATION

Bidders are hereby notified that all information submitted as part of, or in support of Bid submittals will be available for public inspection after the opening of Bids in compliance with Chapter 119 of the Florida Statutes, popularly known as the "Public Record Law." The Bidder shall not submit any information in response to this Bid Solicitation which the Bidder considers to be a trade secret, proprietary, or confidential. The submission of any information to the CRA in connection with this Bid Solicitation shall be deemed conclusively to be a waiver of any trade secret or other protection which would otherwise be available to the Bidder. In the event that the Bidder submits information to the CRA in violation of this restriction, either inadvertently or intentionally, and clearly identifies that information in the Bid as protected or confidential, the CRA may, in its sole discretion, either (a) communicate with the Bidder in writing in an effort to obtain the Bidder's withdrawal of the confidentiality restriction, or (b) endeavor to redact and return that information to the Bidder as quickly as possible, and if appropriate, evaluate the balance of the Bid. The redaction or return of information pursuant to this clause may render a Bid non-responsive.

33. ADDITIONAL FEES AND SURCHARGES

Unless provided for in the Contract, the CRA will not make any additional payments such as fuel surcharges, demurrage fees, or delay-in-delivery charges.

34. COMPLIANCE WITH FEDERAL STANDARDS

All items to be purchased under this Contract shall be in accordance with all governmental standards, to include, but not be limited to, those issued by the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety Hazards (NIOSH), and the National Fire Protection Association (NFPA).

35. BINDING EFFECT

All of the terms and provisions of the Contract, whether so expressed or not, shall be binding upon, inure to the benefit of, and be enforceable by the parties and their respective legal representatives, successors, and permitted assigns.

36. SEVERABILITY

In the event any term or provision of any Contract entered into pursuant to this Bid Solicitation is found by a court of competent jurisdiction to be invalid, the remaining terms and provisions shall continue to be effective and shall be interpreted and given meaning to the greatest possible extent in the absence of any severed terms or provisions.

37. GOVERNING LAW AND VENUE

This Contract and all transactions contemplated by this Contract shall be governed by and construed and enforced in accordance with the laws of the State of Florida without regard to any contrary conflicts of law principle. Venue of all proceedings in connection herewith shall lie exclusively in Palm Beach County, Florida, and each party hereby waives whatever its respective rights may have been in the selection of venue.

38. ATTORNEY'S FEES

In the event it becomes necessary for either party herein to seek legal means to enforce the terms of the Contract, the prevailing party shall be entitled to its reasonable attorney fees and court costs and paralegal fees at both the trial and appellate levels, to the extent permitted by law.

39. EQUAL OPPORTUNITY AND ANTI-DISCRIMINATION

The CRA complies with all laws prohibiting discrimination on the basis of age, race, gender, religion, creed, political affiliation, sexual orientation, physical or mental disability, color or national origin, and therefore is committed to assuring equal opportunity in the award of contracts and encourages small, local, minority, and female-owned businesses to participate.

During the performance of this Contract, the Contractor agrees it will not discriminate or permit discrimination in its hiring practices or in its performance of the Contract. The Contractor shall strictly adhere to the equal employment opportunity requirements and any applicable requirements established by the State of Florida, Palm Beach County, and the Federal government.

The Contractor further acknowledges and agrees to provide the CRA with all information and documentation that may be requested by the CRA from time to time regarding the Bid Solicitation, selection, treatment and payment of subcontractors, suppliers, and vendors in connection with this Contract.

40. CRIMINAL HISTORY BACKGROUND CHECKS

Prior to hiring a contract employee or contracting with an Awarded Bidder, the CRA may conduct a comprehensive criminal background check by accessing any Federal, State, or local law enforcement database available. The contract employee or Awarded Bidder will be required to sign an authorization for the CRA to access criminal background information. The costs for the background checks shall be borne by the CRA.

41. LABOR, MATERIALS, AND EQUIPMENT

Unless specified elsewhere in this Bid Solicitation or the Contract, all labor, materials, and equipment required for the performance of the requirements of the Contract shall be supplied by the Contractor.

42. MINIMUM WAGE REQUIREMENTS

The Contractor shall comply with all minimum wage requirements and the provisions of any other wages laws, as may be applicable to this Contract.

43. PACKING SLIP AND DELIVERY TICKET

A packing slip and/or delivery ticket shall accompany all items during delivery to the CRA. The documents shall include information on the contract number or purchase order, any back order items, and the number or quantity of items being delivered.

44. PURCHASE OF OTHER ITEMS

The CRA reserves the right to purchase other related goods or services, not listed in the Bid Solicitation, during the Contract term. When such requirements are identified, the CRA may request price quote(s) from the Contractor. The CRA, at its sole discretion, will determine if the prices offered are reasonable, and may choose to purchase the goods or services from the Contractor, another contract vendor, or a non-contract vendor.

45. PUBLIC RECORDS

Florida law provides that municipal records shall at all times be available to the public for inspection. Chapter 119, Florida Statutes, the Public Records Law, requires that all material submitted in connection with a Bid response shall be deemed to be public record subject to public inspection upon award, recommendation for award, or thirty (30) days after Bid opening, whichever occurs first. Certain exemptions to public disclosure are statutorily provided for in Section 119.07, Florida Statutes. If the Bidder believes any of the information contained in his/her/its Bid is considered confidential and/or proprietary, inclusive of trade secrets as defined in Section 812.081, Florida Statutes, and is exempt from the Public Records Law, then the Bidder, must in its response, specifically identify the material which is deemed to be exempt and state the legal authority for the exemption. All materials that qualify for exemption from Chapter 119, Florida Statutes or other applicable law must be submitted in a separate envelope, clearly identified as "EXEMPT FROM PUBLIC DISCLOSURE" with the firm's name and the Bid number clearly marked on the outside. The CRA will not accept Bids when the entire Bid is labeled as exempt from disclosure. The CRA's determination of whether an exemption applies shall be final, and the Bidder agrees to defend, indemnify, and hold harmless the CRA and the CRA's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the CRA's treatment of records as public records.

The Contractor shall keep and maintain public records and fully comply with the requirements set forth at Section 119.0701, Florida Statues, as applicable; failure to do so shall constitute a material breach of any and all agreements awarded pursuant to this ITB.

46. CONFLICTS OF INTEREST

All Bidders must disclose with their Bid the name of any officer, director, or agent who is also an employee of the CRA. Further, all Bidders must disclose the name of any CRA employee who has any interest, financial or otherwise, direct or indirect, of five percent (5%) or more in the Bidders' firm or any of its branches. Failure to disclose any such affiliation will result in disqualification of the Bidder from this Invitation to Bid and may be grounds for further disqualification from participating in any future Bids with the CRA.

47. PUBLIC ENTITY CRIMES

As provided in Section 287.133(2) (a), Florida Statutes, a person or affiliate who has been placed on the convicted vendors list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity; may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit Bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity.

48. OTHER GOVERNMENTAL AGENCIES

The Contractor who is awarded and executes a Contract as a result of this ITB, shall allow other governmental agencies to access this Contract and purchase the goods and services under the terms and conditions at the prices awarded, as applicable.

49. COMPLETION OF WORK AND DELIVERY

All work shall be performed and all deliveries made in accordance with good commercial practice. The work schedule and completion dates shall be adhered to by the Contractor, except in such cases where the completion date will be delayed due to acts of nature, force majeure, strikes, or other causes beyond the control of the Contractor. In these cases, the Contractor shall notify the CRA of the delays in advance of the original completion so that a revised delivery schedule can be appropriately considered by the CRA.

50. FAILURE TO DELIVER OR COMPLETE WORK

Should the Contractor fail to deliver or complete the work within the time stated in the Contract, it is hereby agreed and understood that the CRA reserves the authority to cancel the Contract with the Contractor and secure the services of another vendor to purchase the items or complete the work. If the CRA exercises this authority, the CRA shall be responsible for reimbursing the Contractor for work that was completed, and items delivered and accepted by the CRA in accordance with the Contract specifications. The CRA may, at its option, demand payment from the Contractor, through an invoice or credit memo, for any additional costs over and beyond the original contract price which were incurred by the CRA as a result of having to secure the services of another vendor.

51. CORRECTING DEFECTS

The Contractor shall be responsible for promptly correcting any deficiency, at no cost to the CRA, within three (3) calendar days after the CRA notifies the Contractor of such deficiency in writing. If the Contractor fails to correct the defect, the CRA may (a) place the Contractor in default of its Contract; and/or (b) procure the products or services from another source and charge the Contractor for any additional costs that are incurred by the CRA for this work or items, either through a credit memorandum or through invoicing.

52. ACCIDENT PREVENTION AND BARRICADES

Precautions shall be exercised at all times for the protection of persons and property. The Contractor performing services or delivering goods under this Contract shall conform to all relevant OSHA, State, County, and local regulations during the course of such effort. The minimum Personal Protective Equipment (PPE) to be worn by all personnel on the Project Site shall be High-Vis Shirt or Vest with Company Name, Hard Hat, Eye Protection, Ear Protection, Construction Boots, and Face Masks. Any fines levied by the above-mentioned authorities for

failure to comply with these requirements shall be borne solely by the Contractor. Barricades shall be provided by the Contractor when work is performed in areas traversed by persons, or when deemed necessary by the CRA.

53. OMISSIONS IN SPECIFICATIONS

The specifications and/or scope of work contained within this Bid Solicitation describe the various functions and classes of work required as necessary for the completion of the work described in this ITB. Any omissions of inherent technical functions or classes of work within the specifications and/or statement of work shall not relieve the Contractor from furnishing, installing, or performing such work where required to the satisfactory completion of the scope of work as described in this ITB.

54. MATERIALS SHALL BE NEW AND WARRANTED AGAINST DEFECTS

Contractor hereby acknowledges and agrees that all materials, except where recycled content is specifically requested, supplied by the Contractor in conjunction with this Bid Solicitation and resultant Contract shall be new, warranted for their merchantability, and fit for a particular purpose. In the event any of the materials supplied to the CRA by the Contractor are found to be defective or do not conform to specifications, (1) the materials may be returned to the Contractor at the Contractor's expense and the Contract cancelled; or (2) the CRA may require the Contractor to replace the materials at the Contractor's expense.

55. TOXIC SUBSTANCES/FEDERAL "RIGHT TO KNOW" REGULATIONS

The Federal "Right to Know" Regulation implemented by the Occupational Safety and Health Administration (OSHA) requires employers to inform their employees of any toxic substances to which they may be exposed in the workplace, and to provide training in safe handling practices and emergency procedures. It also requires notification to local fire departments of the location and characteristics of all toxic substances regularly present in the workplace.

Accordingly, the Contractor performing under this Contract are required to provide two (2) complete sets of Material Safety Data Sheets to the CRA of any products that are subject to these regulations. This information should be provided at the time when the initial delivery is made.

56. TAXES

The CRA is exempt from Federal and State taxes for tangible personal property.

57. BIDDER'S COSTS

The CRA shall not be liable for any costs incurred by Bidders in responding to this ITB.

58. SUBSTITUTION OF PERSONNEL

It is the intention of the CRA that the Awarded Bidder's personnel proposed in its Bid shall be available for the initial Contract term. In the event the Awarded Bidder wishes to substitute personnel prior to the execution of the Contract, the Awarded Bidder shall propose personnel of equal or higher qualifications, and all replacement personnel are subject to the CRA's written approval. In the event the substitute personnel are not satisfactory to the CRA, and the matter cannot be resolved to the satisfaction of the CRA, the CRA reserves the right to terminate Contract negotiations. In the event the Contractor wishes to substitute personnel after the execution of the Contract, the Contractor shall propose personnel of equal or higher

qualifications, and all replacement personnel are subject to the CRA's written approval. In the event the substitute personnel are not satisfactory to the CRA, and the matter cannot be resolved to the satisfaction of the CRA, the CRA reserves the right to cancel the Contract for cause.

59. FORCE MAJEURE

The CRA and the Contractor are excused from the performance of their respective obligations under the Contract when and to the extent that their performance is directly delayed or prevented by any circumstances beyond their control, including fire, flood, explosion, strikes or other labor disputes, natural disasters, public emergency, war, riot, civil commotion, malicious damage, act or omission of any governmental authority, delay or failure or shortage of any type of transportation, equipment, or service from a public utility needed for their performance provided that:

a. The non-performing party gives the other party prompt written notice describing the particulars of the force majeure, including, but not limited to, the nature of the occurrence and its expected duration, and continues to furnish timely reports with respect thereto during the period of the force majeure.

b. The excuse of performance is of no greater scope and of no longer duration than is required by the force majeure.

c. No obligations of either party that arose before the force majeure causing the excuse of performance are excused as a result of the force majeure.

d. The non-performing party uses its best efforts to remedy its inability to perform.

e. The CRA's approval is required for any force majeure event asserted by the Contractor.

Notwithstanding the above, performance shall not be excused under this section for a period in excess of two (2) months, provided that in extenuating circumstances, the CRA, at its sole discretion, may excuse performance for a longer term. Economic hardship of the Awarded Bidder shall not constitute a force majeure. The term of the Contract shall be extended by a period equal to that during which either party's performance is suspended under this section.

60. NOTICES

Notices shall be effective when received at the addresses specified in the Contract. Changes in respective addresses to which such notices are to be directed may be made from time to time by either party by written notice to the other party. Facsimile and email transmissions shall not constitute effective notice. An original hard copy of the notice must also be mailed via certified mail to the receiving party.

Nothing contained in this section shall be construed to restrict the transmission of routine communications between representatives of the Awarded Bidder and the CRA.

All such notices, demands, requests and other communications which shall have been mailed in such a manner shall be deemed sufficiently served or given for all purposes hereunder on the

third (3rd) day following the date such notice, demand, request or other communication shall be deposited in any post office or branch post office within the continental United States.

61. FISCAL FUNDING OUT

The CRA's obligation pursuant to any Contract entered into in accordance with this ITB is specifically contingent upon the lawful appropriation of funds. Failure to lawfully appropriate funds for any Contract awarded shall result in automatic termination of the Contract.

62. SCRUTINIZED COMPANIES CERTIFICATION

Section 287.135, Florida Statutes, prohibits the DBCRA from: 1) contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, F.S. or is engaged in a boycott of Israel; and 2) contracting with companies, for goods or services over $1,000,000 that are on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, created pursuant to s. 215.473, or are engaged in business operations in Syria. Failure to complete the Scrutinized Companies Certification Pursuant to Florida Statute § 287.135 in Section 5 of this ITB may deem the Bid non-responsive.

END OF SECTION 1

SECTION 2: SPECIAL TERMS AND CONDITIONS

1. PURPOSE

The purpose of this Bid Solicitation is to obtain Bids from qualified contractors and establish a contract for the construction of a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444 ("Project"), in accordance with the terms, conditions, and specifications contained in this Invitation to Bid.

2. CONTRACT MEASURES AND PREFERENCES

Intentionally Omitted.

3. VOLUNTARY PRE-BID MEETING

The CRA will hold a Voluntary Pre-Bid Meeting on September 15, 2022, starting promptly at 10:00 a.m. EST, at the Arts Warehouse, located at 313 NE 3rd Street, Delray Beach, Florida, 33444.

Potential Bidders should bring a copy of this ITB with them to the Voluntary Pre-Bid Meeting. Attendees will be allowed to ask questions of CRA Staff and obtain information on important aspects of this ITB.

The purpose of the Voluntary Pre-Bid Meeting is to provide and obtain information relative to the scope, purpose, nature, and extent of the work, and any local conditions, which may affect the performance of work. Submission of a Bid shall constitute an acknowledgement by the Bidder that it has thoroughly examined and is familiar with the requirements of this Bid Solicitation package. The failure or neglect of the Bidder to examine the Bid Solicitation package, shall in no way relieve the Bidder of any obligation with respect to its Bid, the scope of work required under this Bid Solicitation, or the requirements of any resulting Contract. No claim for additional compensation will be allowed which is based on a lack of knowledge of the requirements of this Bid Solicitation package or the resultant Contract.

4. TERM OF CONTRACT

The Contract shall commence upon the date of the duly executed Contract and shall remain in effect until such time as the construction services acquired in conjunction with this Bid Solicitation have been completed and accepted by the CRA's authorized representative and upon completion of the expressed and/or implied warranty periods.

5. METHOD OF AWARD: BEST VALUE

The CRA will award this Contract to the responsive and responsible Bidder, all factors considered, and in the best interest of the CRA.

6. PRICES SHALL BE FIXED AND FIRM

If the Bidder is awarded a Contract under this Bid Solicitation, the prices offered by the Bidder shall remain fixed and firm during the performance of the work, except for any change orders or variations, which must meet the prior approval and written authorization of the CRA.

7. PRICE ADJUSTMENTS
Intentionally Omitted.

8. EXAMINATION OF CRA FACILITIES OR EQUIPMENT
Prior to submitting its offer, it is recommended that the Bidder visit the site of the proposed Project and become familiar with any conditions which may in any manner affect the work to be done or affect the equipment, materials and labor required. The Bidder is also advised to examine carefully any drawings, specifications, or equipment, and become thoroughly aware regarding any and all conditions and requirements that may in any manner affect the work to be performed under the Contract. No additional allowances will be made because of lack of knowledge of these conditions.

9. EQUAL PRODUCTS
Intentionally Omitted.

10. INCENTIVE COMPENSATION
Intentionally Omitted.

11. LIQUIDATED DAMAGES
Provisions for liquidated damages, if any, are set forth in the resultant Contract.

12. INSURANCE
The Awarded Bidder shall not commence any performance pursuant to the terms of this Bid Solicitation until certification or proof of insurance has been received and approved by the CRA.

The required insurance coverage is to be issued by an insurance company authorized and licensed to do business in the State of Florida, with the minimum rating of A- VIII or better, in accordance with the latest edition of AM Best's Insurance Guide. This insurance shall be documented in certificates of insurance which provides that the CRA shall be notified at least thirty (30) days in advance of cancellation, non-renewal, or adverse change. The receipt of certificates or other documentation of insurance or policies or copies of policies by the CRA or by any of its representatives, which indicate less coverage than is required, does not constitute a waiver of the Awarded Bidder's obligation to fulfill the insurance requirements herein. Deductibles must be acceptable to the CRA.

The Awarded Bidder must submit a current Certificate of Insurance, naming the *Delray Beach Community Redevelopment Agency* as an additional insured and list as such on the insurance certificate. New certificates of insurance are to be provided to the CRA upon expiration.

The Awarded Bidder shall provide insurance coverage as follows, and shall carry:

a. Workers' Compensation Insurance – as required by law.

b. Employer's Liability Insurance - $1,000,000 per occurrence, $1,000,000 for each disease, and $2,000,000 for aggregate disease

c. Comprehensive General Liability Insurance – with limits of not less than $1,000,000 per occurrence and $2,000,000 in the aggregate for Bodily Injury and Property Damage which must include:

   i. Premises and/or Operations on an occurrence basis.
   ii. Independent contractors.
   iii. Products and/or Completed Operations Liability on an occurrence basis.
   iv. Explosion, Collapse, and Underground Coverages.
   v. Broad Form Property Damage.
   vi. Broad Form Contractual Coverage applicable to this specific Agreement, including any hold harmless and/or indemnification agreement.
   vii. Personal Injury Coverage with Employees and Contractual Exclusions removed with minimum limits of coverage equal to those required for Bodily Injury Liability and Property Damage Liability.

d. Builders Risk/Installation Floater Insurance - The Awarded Bidder shall take out and maintain, as applicable, during the life of this Contract, "all risk" type builders risk insurance satisfactory to the CRA for the completed value of the Project, which shall protect the Awarded Bidder and the CRA as their interests may appear, for the following hazards to the work, encompassing structures in the course of construction, including foundations, additions, attachments, and all permanent fixtures belonging to and constituting a part of said structures, as well as materials and equipment suitably stored at the Project site and Awarded Bidder's construction equipment, materials, and temporary structures:
   i. Premises and/or Operations on an occurrence basis.
   ii. Independent contractors.
   iii. Products and/or Completed Operations Liability on an occurrence basis.
   iv. Explosion, Collapse, and Underground Coverages.
   v. Broad Form Property Damage.
   vi. Broad Form Contractual Coverage applicable to this specific Contract, including any hold harmless and/or indemnification agreement.
   vii. Personal Injury Coverage with Employees and Contractual Exclusions removed with minimum limits of coverage equal to those required for Bodily Injury Liability and Property Damage Liability.
   viii. Fire and lightning, vandalism, and malicious mischief.
   ix. Extended coverage including windstorm, hail, flood, explosion, riot, civil commotion, aircraft, vehicle and smoke damage.

e. Automobile Liability Insurance - for owned, non-owned and hired vehicles – with a limit of not less than $1,000,000 per occurrence, combined single limit for Bodily Injury Liability and Property Damage Liability. Coverage must be afforded on a form no more restrictive than the latest edition of the Business Automobile Liability Policy, without restrictive endorsements, as filed by the Insurance Services Office.

The *Delray Beach Community Redevelopment Agency* shall be named as an Additional Insured on both the General Liability and Business Automobile Liability policies, on a primary and non-contributory basis, to include additional insured status on the GL policy for both premises operations and products and completed operations.

If no deductible for insurance is referenced above, the CRA reserves the right to require such deductibles which shall be determined by the CRA, but not less than $25,000 per claim.

The Comprehensive General Liability insurance policy must include coverage that is not more restrictive than the latest edition of the Comprehensive General Liability Policy, without restrictive endorsements, as filed by the Insurance Services Offices, and the policy must include coverage's for premises and/or operations, independent contractors, products and/or completed operations for contracts, contractual liability, broad form contractual coverage, broad form property damage, products, completed operations, and personal injury. Personal injury coverage shall include coverage that has the Employee and Contractual Exclusions removed.

13. PERFORMANCE BOND AND PAYMENT BOND

The Bidder to whom a contingent award is made shall duly execute and deliver to the CRA a Performance Bond and a Payment Bond, both in an amount equal to 100% of the total Contract price, payable to the CRA, as surety for faithful performance under the terms and conditions of the Contract. The Performance Bond and Payment Bond shall be delivered to the CRA contemporaneously with Contract execution. Sample formats for the bonds are available upon request.

Both required bonds must be executed by a surety company of recognized standing, authorized to do business in the State of Florida, and having a resident agent. Bonds may not be canceled, terminated, or revised unless the CRA has been provided with thirty (30) business days' advanced written notice of such action by the surety. The surety must insert the registered agent to accept service of process in the State of Florida, directly on each bond document.

Acknowledgement and agreement are given by both parties that the Performance and Payment Bonds do not limit the liability of the Awarded Bidder to the CRA in the event of a material breach of the Contract by the Awarded Bidder. The Bonds may be used to recover liquidated damages on behalf of the CRA.

If the Awarded Bidder fails to deliver the Bonds at the same time as Contract execution, the CRA may declare the Awarded Bidder in default of the contractual terms and conditions, and the Awarded Bidder shall surrender any Bid Bond, and the CRA shall not accept any offers or bids from that Bidder for a twelve (12) month period following such default.

14. CERTIFICATIONS

Any Bidder that submits a Bid in response to this Bid Solicitation shall, at the time of such Bid submittal, hold all necessary certifications issued by the State or County Examining Board qualifying the Bidder to perform the work proposed for this Project. If other professions or trades are required in conjunction with this Bid Solicitation and such work and/or services will be performed or provided by a subcontractor(s), an applicable Certificate of Competency issued to the subcontractor(s) shall be submitted with the Bidder's Bid; provided, however, that the CRA may at its option and in its best interest allow the Bidder to supply the subcontractor(s) certificate to the CRA during the evaluation period prior to any award of contract.

15. BID BOND/GUARANTY

The Bidder must submit with their Bid a Bid Guaranty represented by a certified check, cashier's check, money order, or Bid Bond in favor of the CRA in the amount equal to five percent (5%) of the proposed Bid Price. The certified check, cashier's check, money order, or Bid Bond shall be made payable to the *Delray Beach Community Redevelopment Agency*. Bidders not selected for award will have their Bid Guaranty returned to them within 90 days of the Bid opening.

If the Awarded Bidder fails or refuses to execute the Contract or provide the necessary certificates of insurance, or the Performance and Payment Bonds following award within the timeframes set forth, the CRA shall retain the entire Bid Guaranty and disqualify the Bidder.

Additionally, **Bidders must submit with their Bid evidence of their financial capacity** to commence and complete the work associated with this Project. Such evidence may include a loan commitment letter, or other documentation clearly supporting the Bidder's financial capacity to commence and complete the work associated with this Project and all necessary responsibilities as stated within this ITB.

16. METHOD OF PAYMENT: INVOICE FOR COMPLETED WORK (PROGRESS PAYMENTS)

The CRA will allow progress payments for the work to be performed under this Contract. Such progress payments shall be only for work that has been completed and verified by the CRA.

The Contractor shall submit an invoice to the CRA for progress payments for work that has been completed and has been inspected and accepted by the CRA. The date of the invoices shall not exceed thirty (30) calendar days from the completion of that portion of the work. Under no circumstances shall the invoice be submitted to the CRA in advance of the completion and acceptance of the work. The invoice shall contain the following basic information: the Contractor's name and address, invoice number, date of invoice, description of the goods or service, the contract number, purchase order number, and any discounts.

The CRA prides itself on paying its vendors promptly and efficiently, and all payments shall be made in accordance with the Florida Prompt Payment Act, Section 218.74, Florida Statutes, upon presentation of a proper invoice by the awarded Bidder.

Payment shall be made for the items listed on the Bid Pricing Form on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, clean up, and all other appurtenances to complete the construction and installation of the work to the configuration and extent as shown on the drawings and described in the specifications.

The CRA does not pay for items ordered and/or stored on site unless specifically approved by CRA and with written authorization from the CRA. Payment for pay for items are paid once the item is installed, measured in place, completed and accepted.

It is intended that all license and other miscellaneous administrative costs, overhead and profit, and all other costs to the Contractor not specifically identified in the item descriptions be distributed among and included in the unit prices stated. No additional payment shall be made for transportation, communications, office maintenance, and other incidental work or services,

and no further payment shall be made for remobilization unless all of the work is suspended by the CRA for a period in excess of three (3) months and through no fault to the Contractor.

The Contractor's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for various appurtenant items of work.

All required manufacturer testing and certification shall be included in the unit prices bid. Density testing required for compacted backfilling, and concrete strength and materials testing required at the time of construction shall be arranged for and paid for by the Contractor.

17. COMPLETION OF WORK

The Contractor shall complete the scope of work as required by this Bid Solicitation within the timeframe stated in Section 3 of this Bid Solicitation.

18. WARRANTY REQUIREMENTS: ONE (1) YEAR

In addition to all other warranties that may be supplied by the Contractor, the Contractor shall warrant its products and/or services against faulty labor and/or defective material, for a minimum period of one (1) year from the date of acceptance of the labor, materials and/or equipment by the CRA. This warranty requirement shall remain in force for the full period; regardless of whether the Contractor is under contract with the CRA at the time of defect. Any payment by the CRA on behalf of the services received from the Contractor does not constitute a waiver of these warranty provisions.

19. ADDITIONAL FACILITIES OR PRODUCTS

Intentionally Omitted.

20. CATALOGS AND PRICE LISTS

Intentionally Omitted.

21. CLEAN UP

The Contractor shall keep the Project Site and work areas free of rubbish and other unusable materials and debris; and shall restore to their original conditions those portions of the work areas not designated for alteration by this Bid Solicitation. Clean up and disposal of rubbish, debris, and unusable materials shall be accomplished at the end of each workday and in such a manner as to maintain a minimum of nuisance and interference to the general public and residents in the vicinity of the Project Site.

The Contractor shall also remove, when no longer needed, all temporary structures and equipment. Upon final completion of the Project, the Contractor shall thoroughly clean up all areas where work has been involved and shall be immediately restore to original condition all work areas not designated for alteration by this Bid Solicitation.

22. DEMONSTRATION OF EQUIPMENT

Intentionally Omitted.

23. HOURLY RATE
Intentionally Omitted.

24. MOTOR VEHICLE LICENSE REQUIREMENT
Intentionally Omitted.

25. PATENTS AND ROYALTIES
The Contractor, without exception, shall indemnify and hold harmless the CRA and its employees from liability of any nature or kind, including cost and expenses for, or as a result of, any copyrighted, patented, or unpatented invention, process, or article manufactured by the Awarded Bidder.

If the Contractor uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the contract prices shall include all royalties or cost arising from the use of such design, device, or materials in any way involved in the work.

26. PRE-CONSTRUCTION CONFERENCE
Prior to the start of construction, the Contractor is required to attend a Pre-Construction Conference with CRA Staff, Architect of Record, and any other party that is designated to represent the CRA for this Project.

The Architect of Record will be responsible for coordinating and schedule the Pre-Construction Conference.

27. RELEASE OF CLAIM REQUIRED
Pursuant Section 255.05, Florida Statutes all payments to the subcontractors shall be made by the Contractor within ten (10) days of receipt of the partial payment from the CRA. With the exception of the first partial payment, the Contractor must pay all of its subcontractors and suppliers who have performed any work or supplied any materials for the Project within ten (10) days after receipt of the partial payment by the Contractor for monies due such subcontractors and suppliers as a result of a percentage of the work completed. The Contractor must provide CRA Staff with duly executed affidavits (subcontractor's statement of satisfaction) or releases of claim from all subcontractors and suppliers who have performed any work or supplied any materials for on the Project as of that date. The affidavit or releases shall certify that said subcontractors and suppliers have been paid their proportionate share of all previous partial payments to the Contractor. In the event such affidavits cannot be furnished, the Contractor may submit an executed consent of surety to requisition payment, identifying the subcontractors and suppliers with the amounts for which the statement of satisfaction cannot be furnished. If the Contractor fails to provide consent of surety to requisition payment, the amount in dispute will be withheld until either the statement of satisfaction is furnished, or the consent of surety to requisition payment is furnished.

28. SUBCONTRACTORS OF WORK SHALL BE IDENTIFIED
As part of its Bid, the Bidder must identify any and all subcontractors that will be used in the performance of the proposed scope of work, their qualifications (including any licenses, certifications, etc.), capabilities, experience, and the portion of the work to be done by the subcontractor. The competency of the subcontractor(s) with respect to experience, skill,

responsibility and business standing shall be considered by the CRA when making the award in the best interest of the CRA. If the Bidder fails to identify any and all subcontractors in the Bid, the Bidder may be allowed to submit this documentation during the Bid evaluation period, prior to the award of any Contract, at the sole and absolute discretion of the CRA.

29. CHANGES

The CRA may at any time, as the need arises, order changes within the scope of the work without invalidating the Contract. If such changes increase or decrease the amount due under the Contract, or the time required for performance of the work, an equitable adjustment shall be authorized by Change Order.

The CRA may, at any time make changes in the details of the scope of work. The Contractor shall proceed with the performance of any changes in the work so ordered by the CRA, unless the Contractor believes that such changes entitle it to a change in the Contract price or time, or both, in which event the Contractor shall give the CRA immediate written notice thereof after the receipt of the ordered change. Thereafter, the Contractor shall document the basis for the change in Contract price or time within ten (10) calendar days. All changes resulting in a request for added time must be accompanied by a Time Impact Analysis.

Changes in the scope of work may be accomplished by change order, construction change directive, or field order. Any one of these documents shall be interpreted as further instruction from the CRA.

A change order shall be based upon agreement between the CRA and the Contractor; a construction change directive may or may not be agreed to by the Contractor; a field order for a minor change in the work may be issued by the CRA.

Changes in the work shall be performed under applicable provisions of the Contract documents, and the Contractor shall proceed promptly, unless otherwise provided in the change order, construction change directive, or field order.

A change order will be prepared and signed by the CRA and Contractor, stating their agreement upon all of the following:

a. a change in the scope of work;

b. the amount of the adjustment in the Contract price, if any; and

c. the extent of the adjustment in the Contract time, if any.

The issuance of a change order shall be full and final settlement for any issue or item addressed in the change order. No change order will be accepted or processed with any "reservation of rights" notations or clauses.

30. FAILURE TO DELIVER OR COMPLETE WORK

Should the Contractor fail to deliver or complete the work within the time stated in the Contract, it is hereby agreed and understood that the CRA reserves the authority to cancel the Contract with the Contractor and secure the services of another vendor to purchase the items or

complete the work. If the CRA exercises this authority, the CRA shall be responsible for paying the Contractor for work which was completed and items delivered and accepted by the CRA in accordance with the Contract specifications. The CRA may, at its option, demand payment from the Contractor, through an invoice or credit memo, for any additional costs over and beyond the original Contract price, which were incurred by the CRA, as a result of having to secure the services of another vendor.

31. WORK COVERED BY CONTRACT DOCUMENTS

The work covered by these specifications comprises, in general, the furnishing of all labor, equipment, materials, and performing all operations to construct the improvements, including but limited to roadway, water, sewer, drainage, structural, landscaping, and electrical improvements for the CRA as described and specified further in this ITB, and the Technical Specifications and as shown on the Construction Documents, Exhibits, Addenda, or Amendments to the Contract Documents.

Except as specifically noted, the Contractor shall provide and pay for:

a. Labor, materials, tools, construction equipment, and machinery.
b. Water and utilities required for construction.
c. Other facilities and services necessary including: all required testing, and for proper execution and completion of the scope of work required for the Project.

The Contractor shall comply with all Federal, State, local codes, ordinances, rules, regulations, orders, permits and other legal requirements of the CRA.

32. OTHER FORMS OR DOCUMENTS

If the CRA is required by the Contractor to complete and execute any other forms or documents in relation to this Bid Solicitation, the terms, conditions, and requirements in this Bid Solicitation shall take precedence to any and all conflicting or modifying terms, conditions or requirements of the Contractor's forms or documents.

33. SILTATION AND BANK EROSION

The Contractor shall take adequate precautions to minimize siltation and bank erosion in the vicinity of canals or ditches, in discharging well point systems, or during other construction activities.

34. STORAGE OF MATERIALS

Suitable storage facilities shall be furnished by the Contractor. All materials, supplies and equipment intended for use in the work to complete the Project shall be suitably stored by the Contractor to prevent damage from exposure, admixture with foreign substances, vandalism, or other cause. All hazardous materials must be stored in compliance with all pertinent requirements concerning their safe use and storage. The CRA will refuse to accept, or sample for testing, materials, supplies or equipment that have been improperly stored, as determined by the CRA.

Materials found unfit for use shall not be incorporated in the work and shall immediately be removed from the construction or storage site. Delivered materials shall be stored in manner acceptable to the CRA before any payment for same will be made. Materials strung out along

the line of construction will not be allowed unless the materials will be installed within one (1) week from the time of unloading and stringing out.

35. PRESERVATION OF PROPERTY

The Contractor shall preserve from damage all property along the line of the work, or which is in the vicinity of or is in any way affected by the work, the removal or destruction of which is not called for by the plans. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the CRA.

In case of failure on the part of the Contractor to restore such property, or make good such damage for injury, the CRA may, after 48 hours' notice to the Contractor, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary and the cost thereof will be deducted from any monies due or which may become due the Contractor under the resultant contract.

36. PUBLIC SAFETY AND CONVENIENCE

The Contractor shall at all times so conduct its work as to ensure the least possible obstruction to traffic, or inconvenience to the general public and residents in the vicinity of the work. No road, street, or parking area shall be closed to the public, except with the permission of the CRA and any other jurisdictional governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible. Provisions shall be made by the Contractor to ensure public access to sidewalks, parking, public telephones, and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches. No open excavation shall be left overnight. All open excavation within the roadway shall be backfilled and a temporary asphalt patch applied prior to darkness each day. A cold asphalt patch is acceptable.

37. SAFETY AND OSHA COMPLIANCE

The Contractor shall comply in all respects with all Federal, State and local safety and health regulations. Copies of the Federal regulations may be obtained from the U.S. Department of Labor, Occupation Safety and Health Administration (OSHA), Washington, DC 20210 or their regional offices.

The Contractor shall comply in all respects with the applicable Workers' Compensation Law.

38. CONTRACTOR'S USE OF PREMISES

The Contractor shall coordinate use of Project Site and other work areas under direction of CRA Staff. The Contractor may request complete use of the Project Site from the CRA. The Contractor shall not use any private property, municipal property, or CRA property outside of the Project Site not governed by a Temporary Construction Easement, License Agreement, or other legally binding agreement allowing such use.

The Contractor shall assume full responsibility for the protection and safekeeping of equipment and materials stored on the Project Site.

The Contractor shall move any stored products, materials, equipment, etc. that is under the Contractor's control, that interferes with the operations of the CRA or impedes public access to

sidewalks, parking, public telephones, and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches.

END OF SECTION 2

SECTION 3: SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

1. GENERAL SCOPE OF WORK

The Contractor shall furnish all labor, equipment, materials, and perform all operations necessary to provide the construction services necessary to complete the construction of a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, for the CRA in accordance with the Florida Building Code and the City of Delray Beach construction standards, and in accordance with the Technical Specifications and Construction Drawings, and other documents contained in this ITB.

2. PROJECT BACKGROUND

The Project site is a CRA-owned commercial property located in the Southwest Neighborhood at 95 SW 5th Avenue on the Historic NW/SW 5th Avenue commercial corridor.

A small public parking lot was constructed on the east side of the property in 2010 and the west side was left vacant to accommodate future development.

To encourage economic development and activation of the Historic NW/SW 5th Avenue commercial corridor, the CRA engaged an architect in FY 2018-19 to prepare design and construction drawings to develop a commercial building geared towards the purpose of providing affordable commercial retail space.

3. PROJECT DESCRIPTION

The Project involves the construction of a new two (2) story approximately 7,089 sq. ft. commercial building.

The ground floor area is approximately 2,245 sq. ft. and will include the lobby, staircase, restrooms, elevator, and one (1) commercial, retail, or office space with access from SW 5th Avenue.

The second-floor area is approximately 4,844 sq. ft. and will include restrooms, elevator, staircase, and two (2) commercial, retail, or office spaces.

The existing parking lot (with current access from SW 1st Avenue) will be reconstructed to have a total of five (5) parking spaces (two (2) of the parking spaces will be ADA compliant) plus bicycle parking for 6 bicycles.

The Contractor will be responsible for utility coordination which will include removal of light poles, installing new light poles, light box relocation, and any other utility work required for the project. Current FPL utility lines are underground.

During the first quarter of 2020, the CRA submitted a request for approval of a Class V Site Plan to the City of Delray Beach. A waiver required to move forward with the Project was approved by the Site Plan Review and Appearance Board (SPRAB) on April 28, 2021, and by the City Commission on May 18, 2021. The SPRAB approved the Class V Site Plan on August 25, 2021. The Architect of Record and the CRA are working on finalizing approval for City of Delray Beach Building Permit 22-00201687 for this Project.

The Building Permit will be paid for by the CRA; this cost shall not be included in the Bid Price. The Building Permit will be pulled by the Contractor when the Notice to Proceed is issued by the CRA.

The Contractor will also be responsible for obtaining the necessary agreements for staging and parking purposes.

The Contractor, Architect of Record, and the CRA will attend weekly meetings, in person or virtually, for the purpose of providing status updates on the Project. Meetings will be coordinated by the Contractor.

4. TECHNICIAL SPECIFICATIONS

Technical Specifications for this Project are herein incorporated into this Bid Solicitation as Exhibit A, Technical Specifications.

5. CONSTRUCTION DRAWINGS

Construction Drawings for this Project are herein incorporated into this Bid Solicitation as Exhibits B.

6. REQUIREMENTS

a. Working hours for this Project shall be:
   i. 8:00 a.m. EST to 5:00 p.m. EST Monday through Friday, except holidays
   ii. 8:00 a.m. EST to 5:00 p.m. EST Saturday, if required and previously requested by the Contractor and approved by the CRA.

b. Pay Applications shall be reviewed and approved by the Architect of Record prior to submitting to the CRA.

c. Inspections by the Architect of Record shall be coordinated with all parties (CRA, Architect of Record, and Contractor) at least 5 business days in advance. Inspections shall occur during regular business hours (8:00 a.m. EST to 5:00 p.m. EST Monday through Friday, except holidays.) Documentation of inspection shall accompany every Pay Application.

7. PROJECT TIMELINE

The Contractor agrees to complete the Project within the timeframe designated by the CRA. The Contractor shall agree to complete the Project no later than 365 calendar days after the Notice to Proceed is issued. The CRA, at its discretion, may allow for time extensions for unforeseen and unexpected delays.

The anticipated start date for the Project will occur shortly after the CRA Board awards a contract and a contract is fully executed by the Awarded Bidder and the CRA.

END OF SECTION 3

SECTION 4: MINIMUM QUALIFICATIONS

Along with information requested elsewhere in this ITB, Bidders shall submit information and documentation requested in this Section that confirms it meets the minimum qualification requirements.

1. Bidder has a State of Florida General Contractor's license, or a current certificate of competency issued by Palm Beach County Examining Board having jurisdiction over licensing of Contractors in the type of work involved in this Bid Solicitation.

   Provide supporting documentation in the form of a copy of license(s) and/or certificates that the Bidder meets this qualification:

   a. Certified under Section 489.119, Florida Statutes, to engage in contracting through a certified or registered general contractor or a certified or registered building contract as the qualifying agent.

2. Bidder must have been in business under its current business name for a minimum of five (5) years prior to the Bid Submission Due Date and Time.

   Provide supporting documentation (e.g. state, county, city business license; occupational license) that confirms Bidder meets this qualification:

   a. In business under current business name for a minimum of five (5) years prior to the Bid Submission Due Date and Time.

3. **Provide proof that Bidder is registered with the State of Florida, Division of Corporations to do business in Florida.**

4. **Provide proof that Bidder has a City of Delray Beach Business Tax Receipt.**

   a. Note: If Bidder does not have a City of Delray Beach Business Tax Receipt at the time of Bid Submission, Awarded Bidder will be required to obtain a City of Delray Beach Business Tax Receipt prior to finalization of the Contract.

5. Bidder has no reported conflict of interests in relation to this ITB. No additional documentation is required. The CRA will verify from Bidder's Conflict of Interest Disclosure Form.

6. Bidder shall have experience as the Prime Contractor for at least five (5) completed or currently ongoing projects of similar size, scope, and complexity (e.g., new commercial building structures), within the last seven (7) years. Bidder must have a proven record of successfully completing or working on new commercial building projects, and preferably a record of completing or working on public construction projects. Bidder must have a proven track record of coordinating trades required for structural, mechanical, plumbing, and electrical work required for new commercial buildings.

a. **Bidder must provide at least five (5) Project Reference Forms for the aforementioned projects used to prove experience** and indicate: a) Bidder's role and responsibilities for the listed project; b) client's name and address including a contact person, email address, and phone number for reference verification; c) description of the project and work completed; d) total dollar value of the contract; e) contract duration; f) Bidder's team members on the reference project and whether those team members will be a part of this Project identified in this Bid Solicitation; and g) for completed projects, provide letters of certification of final acceptance or similar project closure documentation issued by the client and include available performance evaluations;

7. Bidder is NOT listed on the Florida Department of Management Services, Convicted Vendor List as defined in Florida Statute Section 287.133(3)(d). No documentation from Bidder is required. The CRA will verify the status.

8. Bidder Is NOT listed on the Florida State Board of Administration, Scrutinized List of Prohibited Companies. Provide an executed copy of the Scrutinized Company Certification form included in this RFP. The CRA will verify status.

9. **Bidder shall provide a short narrative which shall include a general introduction statement, a brief overview of the Bidder and its team members (including subconsultants), and why the Bidder is the most qualified for this Project.**

10. **Bidder shall provide the names, roles, responsibilities, and experience of all subcontractors to be used for this Project.**

    a. Bidders must provide all applicable Certificate of Competency(ies) issued to the subcontractor(s).

END OF SECTION 4

SECTION 5: BID FORMS AND AFFIDAVITS

BID FORMS AND AFFIDAVITS

The forms listed below shall be completed by an authorized agent of the Bidder having legal authorization to contractually bind the Bidder's company or firm. Each signature/acknowledgement represents a binding commitment upon the Bidder to provide the goods and/or services offered to the CRA if the Bidder is awarded the Contract.

1. Bid Submittal Page
2. Solicitation Summary Form
3. Acknowledgement of Addenda
4. Bid Submittal Signature Page
5. Bid Pricing Form (Schedule of Values)
6. Conflict of Interest Disclosure Form
7. Scrutinized Companies Certification Pursuant to Florida Statutes § 287.135
8. Notification of Public Entity Crimes Law
9. Notification of Public Records Law
10. Drug-Free Workplace
11. Non-Collusion Affidavit
12. Sample Bid Bond (Example of Required Bid Bond to be submitted)

BID SUBMITTAL PAGE

This Bid Submittal Page and all following pages shall be included in the original Bid package.

Please also include any additional information or documentation as required by this ITB.

INSTRUCTIONS
Sealed Bids must be received by the CRA on or before the Bid Submission Due Date and Time via hard copy at the CRA Office , located at 20 N. Swinton Avenue, Delray Beach, Florida 33444. Normal business hours are 8:00 AM EST to 5:00 PM EST, Monday through Friday, except holidays. All Bids will be publicly opened at the CRA Office immediately after the Bid Submission Due Date and Time unless otherwise specified.

Each Bid submitted to the CRA shall have the following information clearly marked on the face of the package: Bidder's name, return address, ITB number, Bid Submission Due Date, and the title of the Bid. Included in the package shall be one (1) hard copy clearly identified as the "Original" that include signed originals of all required forms, and one (1) electronic version of the Bid on a Universal Serial Bus (USB) drive in legible and searchable PDF format. If any of the required forms are not included in the Bid and/or are not signed or if any of the required information is not included in the Bid, the CRA may deem the Bid non-responsive. Bids deemed non-responsive are not evaluated or considered by the CRA.

ITB CRA No.: **2022-01**

Title: **95 SW 5th Avenue Commercial Building Construction**

Due Date and Time: **October 21, 2022 @ 2:00 PM EST**

Name of Bidder

SOLICITATION SUMMARY FORM

IMPORTANT NOTICE
The information you provide on this page will be read aloud at the PUBLIC OPENING for this Bid Solicitation. It is VERY IMPORTANT that the summary information you provide below is exactly the same information contained in your Bid. If subsequent to the opening of Bids, the CRA determines that the information contained in your Bid is different from the information on this Solicitation Summary Form, the CRA reserves the right to deem your Bid NON-RESPONSIVE, and remove your Bid from further evaluation and consideration for contract award.

BID INFORMATION

Bid Number: ITB CRA No. 2022-01

Title: 95 SW 5th Avenue Commercial Building Construction

Due Date and Time: October 21, 2022 @ 2:00PM EST

Name of Bidder: _____

Address: _____

Bid Amount: $_____

Written Bid Amount: _____

Authorized Agent: _____

Authorized Agent Signature: _____

Date: _____

By signing and submitting this Solicitation Summary Form, the Bidder affirms that the information provided above is an exact and correct summary of the information contained in the Bidder's Bid to the Delray Beach Community Redevelopment Agency.

THIS SOLICITATION SUMMARY MUST BE SIGNED AND INCLUDED AS AN ORIGINAL HARDCOPY IN THE SEALED PACKAGE CONTAINING YOUR BID.

ACKNOWLEDGEMENT OF ADDENDA

INSTRUCTIONS: COMPLETE PART I OR PART II, WHICHEVER APPLIES, AND SIGN

PART I:

List below the dates of issue for each addendum received in connection with this Solicitation:

Addendum #1, Dated _____

Addendum #2, Dated _____

Addendum #3, Dated _____

Addendum #4, Dated _____

Addendum #5, Dated _____

Addendum #6, Dated _____

Addendum #7, Dated _____

Addendum #8, Dated _____

PART II:

☐ NO ADDENDUM WAS RECEIVED IN CONNECTION WITH THIS SOLICITATION

_____

Name of Bidder

_____

Authorized Agent Signature

_____

Name and Title of Authorized Agent (Print or Type)

_____

Date

BID SUBMITTAL SIGNATURE PAGE

By signing this Bid, the Bidder certifies that it satisfies all legal requirements as an entity to do business with the Delray Beach Community Redevelopment Agency, including all Conflict of Interest and Code of Ethics provisions.

Name of Bidder:

_____

Street Address:

_____

Mailing Address (if different than Street Address):

_____

Telephone Number(s): _____

Fax Number(s): _____

Email Address: _____

Federal Employer Identification Number: _____

Prompt Payment Terms: _____% _____ days' net _____days

Signature: _____
(Signature of Authorized Agent)

Authorized Agent Name: _____

Title: _____

By signing this document, the Bidder agrees to all Terms and Conditions of this Bid Solicitation and the resulting Contract/Agreement.

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER TO BE BOUND BY THE TERMS OF ITS OFFER, FOR NOT LESS THAN 90 DAYS, AND THE BIDDER'S UNEQUIVOCAL OFFER TO BE BOUND BY THE TERMS AND CONDITIONS SET FORTH IN THIS INVITATION TO BID. FAILURE TO SIGN THIS BID SOLICITATION WHERE INDICATED ABOVE, BY AN AUTHORIZED REPRESENTATIVE, SHALL RENDER THE BID NON-RESPONSIVE. THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER TO THE TERMS OF ITS OFFER.

BID PRICING FORM

1. PRICE
   Bidder shall indicate the firm and fixed price offered to the Delray Beach Community Redevelopment Agency for the work described in this Bid Solicitation.

2. SCHEDULE OF VALUES
   Bidder shall submit a schedule of values supporting the Bid Price.

3. PROJECT COMPLETION
   Bidder agrees that the work will be finally complete **no later than 365 calendar days** from the date of issuance of the Notice to Proceed.

BID PRICE:

$ _____
DOLLAR AMOUNT

_____
WRITTEN DOLLAR AMOUNT

_____
Bidder Name

_____
Authorized Agent Signature Date

_____
Printed Name and Title

CONFLICT OF INTEREST DISCLOSURE FORM

The award of this Contract is subject to the provisions of Chapter 112, *Florida Statutes*. All Bidders must disclose within their Bids: the name of any officer, director, or agent who is also an employee of Delray Beach Community Redevelopment Agency ("CRA").

Furthermore, all Bidders must disclose the name of any CRA employee who owns, directly, or indirectly, an interest of more than five percent (5%) in the Bidder's firm or any of its branches.

The purpose of this disclosure form is to give the CRA the information needed to identify potential conflicts of interest for evaluation team members and other key personnel involved in the award of this contract.

The term "conflict of interest" refers to situations in which financial or other personal considerations may adversely affect, or have the appearance of adversely affecting, an employee's professional judgment in exercising any CRA duty or responsibility in administration, management, instruction, research, or other professional activities.

Please check one of the following statements and attach additional documentation if necessary:

_____ To the best of our knowledge, the undersigned firm has no potential conflict of interest due to any other Cities, Counties, contracts, or property interest for this Bid.

_____ The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest due to other Cities, Counties, contracts, or property interest for this Bid.

Acknowledged by:

_____
Bidder Name

_____
Authorized Agent Signature

_____
Name and Title (Print or Type)

_____
Date

SCRUTINIZED COMPANIES CERTIFICATION PURSUANT TO *FLORIDA STATUTES* § 287.135

I, _____, on behalf of _____,
Print Name and Title Company Name

certify that_____ does not:
Company Name

1. Participate in a boycott of Israel; and
2. Is not on the Scrutinized Companies that Boycott Israel List; and
3. Is not on the Scrutinized Companies with Activities in Sudan List; and
4. Is not on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List; and
5. Has not engaged in business operations in Syria.

Submitting a false certification shall be deemed a material breach of contract. The Delray Beach Community Redevelopment Agency ("DBCRA") shall provide notice, in writing, to the Contractor of the DBCRA's determination concerning the false certification. The Contractor shall have ninety (90) days following receipt of the notice to respond in writing and demonstrate that the determination of false certification was made in error. If the Contractor does not demonstrate that the DBCRA's determination of false certification was made in error then the DBCRA shall have the right to terminate the contract and seek civil remedies pursuant to *Florida Statutes* § 287.135.

Section 287.135, *Florida Statutes*, prohibits the DBCRA from:
1) Contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, F.S. or is engaged in a boycott of Israel; and
2) Contracting with companies, for goods or services over $1,000,000.00 that are on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, created pursuant to s. 215.473, or are engaged in business operations in Syria.

As the person authorized to sign on behalf of the Contractor, I hereby certify that the company identified above in the section entitled "Contractor Name" does not participate in any boycott of Israel, is not listed on the Scrutinized Companies that Boycott Israel List, is not listed on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, and is not engaged in business operations in Syria. I understand that pursuant to section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees, and/or costs. I further understand that any contract with the DBCRA for goods or services may be terminated at the option of

the DBCRA if the company is found to have submitted a false certification or has been placed on the Scrutinized Companies with Activities in Sudan list or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List.

_____
COMPANY NAME

_____
SIGNATURE

_____
PRINT NAME

_____
TITLE

Must be executed and returned with the Bid to be considered.

NOTIFICATION OF PUBLIC ENTITY CRIMES LAW

Pursuant to Section 287.133, *Florida Statutes*, you are hereby notified that a person or affiliate who has been placed on the convicted contractors list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases or real property to a public entity, may not be awarded or perform work as a contractor, supplier, sub-vendor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 [F.S.] for Category Two [$35,000.00] for a period of thirty-six (36) months from the date of being placed on the convicted contractors list.

Acknowledged by:

_____
Bidder Name

_____
Authorized Agent Signature

_____
Name and Title (Print or Type)

_____
Date

PUBLIC RECORDS LAW

Notification of Public Records Law Pertaining to Public Contracts and Requests for Contractor Records Pursuant to Chapter 119, Florida Statutes

Pursuant to Chapter 119, *Florida Statutes*, Contractor shall comply with the public records law by keeping and maintaining public records required by the Delray Beach Community Redevelopment Agency ("CRA") in order to perform the service. Upon request from the CRA custodian of public records, contract shall provide the CRA with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, *Florida Statutes* or as otherwise provided by law. Contractor shall ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract If the Contractor does not transfer the records to the CRA. Contractor upon completion of the contract, shall transfer, at no cost, to the CRA all public records in possession of the Contractor or keep and maintain public records required by the CRA in order to perform the service. If the Contractor transfers all public records to the CRA upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the CRA, upon request from the CRA custodian of public records, in a format that is compatible with the information technology systems of the CRA.

IF T E AWARDED BIDDER AS QUESTIONS REGARDING T E APPLICATION OF C APTER 119, FLORIDA STATUTES, TO T E AWARDED BIDDER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO T IS AGREEMENT, CONTACT T E CUSTODIAN OF PUBLIC RECORDS, C RISTINE TIBBS, AT T E DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY, 20 N. SWINTON AVE., DELRAY BEAC FLORIDA AND MAY BE CONTACTED BY P ONE AT 561-276-8640 OR VIA EMAIL AT TIBBSC MYDELRAYBEAC .COM.

Acknowledged by:

_____
Bidder Name

_____
Authorized Agent Signature

_____
Name and Title (Print or Type)

_____
Date

DRUG-FREE WORKPLACE

_____is a drug-free workplace and has
(Company Name)
a substance abuse policy in accordance with and pursuant to Section 440.102, *Florida Statutes*.

Acknowledged by:

_____
Bidder Name

_____
Authorized Agent Signature

_____
Name and Title (Print or Type)

_____
Date

NON-COLLUSION AFFIDAVIT

STATE OF _____
COUNTY OF _____

Before me, the undersigned authority, personally appeared _____, who, after being by me first duly sworn, deposes and says of his/her personal knowledge that:

a. He/She is _____ of _____, the Bidder that has submitted a Bid to perform work for the following:

ITB CRA No.: _____ Title: _____

b. He/She is fully informed respecting the preparation and contents of the attached Request for Bids, and of all pertinent circumstances respecting such Solicitation.

Such Bid is genuine and is not a collusive or sham Bid.

c. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with the Solicitation and contract for which the attached Bid has been submitted or to refrain from proposing in connection with such Solicitation and contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or any other Bidder, or to fix any overhead, profit, or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the CRA or any person interested in the proposed contract.

d. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

_____
Signature

Subscribed and sworn to (or affirmed) before me this _____ day of _____ 20__, by _____, who is personally known to me or who has produced _____ as identification.

SEAL

Notary Signature_____
Notary Name: _____
Notary Public (State): _____
My Commission No: _____
Expires on: _____

SAMPLE BID BOND

STATE OF FLORIDA)
) SS
COUNTY OF _____)

KNOW ALL MY BY THESE PRESENTS that _____ as Principal, and _____ as surety, are held and firmly bound unto the Delray Beach Community Redevelopment Agency, Florida, hereinafter called the CRA in the penal sum of _____ dollars ( ) lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas the Principal has submitted the accompanying bid, dated _____, for project titled:

95 SW 5th Avenue Commercial Building Construction
Delray Beach Community Redevelopment Agency
ITB CRA No. 2022-01

NOW, THEREFORE,

(a) It is a condition precedent to the submission of said bid that a certified check, cashier's check or bid bond in the amount of five percent (5%) of the base bid be submitted with said bid as a guarantee that Bidder would, if awarded the contract, enter into a written contract with the CRA for the completion of the Work specified in the Contract Documents for the amount indicated in the Bid.

(b) If the Principal shall not withdraw said bond within (90) days after date of the same, and shall within (30) days after the prescribed forms are presented to him for signature, enter into a written contract with the CRA in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligation shall be void and of no effect, otherwise the sum herein stated shall be due and payable to the CRA and the surety herein agrees to pay said sum immediately upon demand of the CRA in good and lawful money of the United States of America as liquidated damages for failure thereof of said principal.

IN WITNESS WHEREOF, the above-bounded parties executed this instrument under their several seals, this _____ day of _____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

I _____ (person), on behalf of
(surety)
_____ (Surety Company) have read

and examined the Performance and Payment Bonds attached to Bid No._____.

_____ Date: _____
Signature

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses required). (If Corporation, Secretary Only will attest and affix seal)

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

PRINCIPAL

_____
(firm name)

By: _____
(Signature of Authorized Officer)

(affix Seal)

Print Name: _____

Title: _____

Business Address:
_____
_____
_____

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

SURETY

_____
(firm name)

By: _____
(Signature, Attorney-in-Fact)

(affix Seal)

Print Name: _____

Business Address
_____
_____
_____

Name of Local Insurance Agency

_____

SECTION 6: EXHIBITS

Exhibit A: Technical Specifications (Separately Attached)

Exhibit B: Construction Drawings (Separately Attached)

Exhibit C: Property Map and Photos

Exhibit D: Property Summary

Exhibit E: Project Reference Form

Exhibit A: Technical Specifications

Exhibit A is separately attached.

Please remember to separately download Exhibit A – Technical Specifications.

Exhibit B: Construction Drawings

Exhibit B is separately attached.

Please remember to separately download Exhibit B – Construction Drawings

EXHIBIT C: PROPERTY MAP

Project Site is outlined in red.

Project Site Photos

Bidders are encouraged to visit the Project Site on their own time.

EXHIBIT D: PROPERTY SUMMARY

Property Detail

Show Full Map

Location Address	95 SW 5TH AVE
Municipality	DELRAY BEACH
Parcel Control Number	12-43-46-17-06-029-0280
Subdivision	DELRAY BCH RESUB BLK 29 IN
Official Records Book/Page	22581 / 1328
Sale Date	APR-2008
Legal Description	DELRAY BCH RESUB BLK 29 LT 28 (LESS W 5 FT SW 5TH AVE & TRGLR PAR R/WS) & LT 29 (LESS W 5 FT SW 5TH AVE R/W) BLK 29

Nearby Sales Search

Owner Information

Change of Address

Owner(s)	Mailing Address
DELRAY BEACH CRA	20 N SWINTON AVE DELRAY BEACH FL 33444 2632

Sales Information

Sales Date	Price	OR Book/Page	Sale Type	Owner
APR-2008	$215,000	22581 / 01328	WARRANTY DEED	DELRAY BEACH CRA
JUN-2000	$2,061	11825 / 00337	TAX DEED	VASQUEZ VINCENT

NOTE: Sales do not generally appear in the PAPA database until approximately 1 to 3 weeks after the closing date. If a recent sale does not show up in this list, please allow more time for the sale record to be processed.

Exemption Information

Portability Calculator

Exemption Year: 2022

Applicant/Owner	Year	Detail
	2022	

Property Information

Tangible Account(s)

Subarea and Sq. Footage for Building 0		Structural Element for Building 0	Sketch for Building 0
Code Description	Sq. Footage		No Image Found
No Data Found.			

Number of Units	0 View Building Details
Total Square Feet*	0
Acres	0.1716
Property Use Code	8900 - MUNICIPAL
Zoning	CBD - CBD-CENTRAL BUSINESS (12-DELRAY BEACH)

* May indicate living area in residential properties.

Request Structural Details Change

Appraisals

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Improvement Value	$22,876	$23,446	$24,017	$13,099	$12,995
Land Value	$129,629	$129,629	$123,456	$77,160	$59,182
Total Market Value	$152,505	$153,075	$147,473	$90,259	$72,177

All values are as of January 1st each year

Assessed and Taxable Values

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Assessed Value	$105,676	$96,069	$87,335	$79,395	$72,177
Exemption Amount	$105,676	$96,069	$87,335	$79,395	$72,177
Taxable Value	$0	$0	$0	$0	$0

Taxes

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Ad Valorem	$0	$0	$0	$0	$0
Non Ad Valorem	$78	$78	$78	$78	$78
Total tax	$78	$78	$78	$78	$78

*Buyers take note: Taxes will change and often increase substantially when a property sells. The seller's exemption benefits will GO AWAY the year after they sell and this may result in higher taxes for a buyer. Please use the Property Tax Calculator to get a better annual tax estimate if you are purchasing this property.

Property Tax Calculator | Property Tax Detail | Tax Collector

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name:
Reference Project Name:
Reference Project Location:
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
Compensation for Services Provided:
Reference Project Start Date and Completion Date:
Reference Project Construction Cost:
Reference Project Construction Start Date and Completion Date:
Reference Project Completed on Time and Within Budget:
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Reference Project Contact Information
Contact Name and Title:
Company/Organization:
Phone and Email:

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: _____
Authorized Agent Name and Title: _____
Date: _____

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 1
TO
INVITATION TO BID NO. CRA 2022-01
95 SW 5TH AVENUE COMMERCIAL BUILDING CONSTRUCTION

OCTOBER 10, 2022

TO ALL PROPOSERS AND OTHERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Questions contained in this Addendum include ones asked at the September 15, 2022, Voluntary Pre-Bid Meeting. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

MODIFICATION:

Wherever applicable throughout the ITB document, Bidders are hereby advised that the Bid Submission Due Date and Time has been extended to **Wednesday, November 9, 2022, at 3:00PM EST**. The location of delivery for the Bids has not changed.

QUESTIONS:

1. **What is the estimated construction budget?**

   The budget for this Project is to be determined. The Project is a part of the Delray Beach CRA's Fiscal Year 2022-2023 Work Plan and is fully funded. The ITB document includes all Technical Specifications and Construction Documents for the specific purpose of obtaining Bids from all interested qualified Bidders.

---

2. **What is the work schedule for the Project?**

Section 3, Scope of Work and Technical Specifications, of the ITB provides the working hours for the Project:

Working hours for this Project shall be:

i. 8:00 a.m. EST to 5:00 p.m. EST Monday through Friday, except holidays
ii. 8:00 a.m. EST to 5:00 p.m. EST Saturday, if required and previously requested by the Contractor and approved by the CRA.

Work shall not be performed on City Holidays and Sundays.

---

3. **Can the Owner provide the specification for the elevator? Specifically, elevator type, manufacturer, and cab finishes.**

Please see below specification for the elevator:

Basis of Design:	Thyssenkrupp Endura HMRL (Hydraulic Machine Room Less) One Speed - Right Hand 3,000 lbs. Capacity – 150 fpm

Cab finishes will be selected by the Owner and provided to the Contractor.

---

4. **The plans show a new dumpster. Can the Owner provide the drawings for the dumpster detail and dumpster gate?**

There is no dumpster for this Project. There is an enclosed room with a louvered door which will store two rolling trash bins (96 gallons) that will be manually rolled to the curbside for pick-up.

Refer to sheets A-201, A-600, and A-800 for room and louvered door details.

Trash bins will be purchased by the CRA. Bidders shall not include the cost of trash bins in their submitted Bid Price.

---

5. **Can the Owner provide the Geotechnical Report for the Project?**

A Geotechnical Report is being finalized; it will be provided to the Awarded Bidder.

---

6. **Specifications call for the removal of buried underground tanks. Can the Owner please provide clarify if there are any buried underground tanks?**

There are no buried underground tanks that need to be removed.

Please disregard Specification Section 026500.

---

7. **Can the Owner please provide a detail for the concrete pavement area designed for the parking area. These are not shown either on civil or structural plans.**

   A minimum concrete slab thickness of 6" with #4 bars 12" o.c. both ways with a minimum compressive strength of 4,000psi at 28days.

   Based upon the design, the minimum concrete pavement elevation is 14.50", and assuming a 6" slab allows for a minimum of 12" of subgrade between the top of the Stormcapture® vaults and the bottom of the concrete pavement.

   Please refer to note number 18.18.2 subgrade materials specifications.

   The details and specifications related to the Stormcapture system are attached to this Addendum.

---

8. **Does the CRA have a place or empty lot in the vicinity of the Project that the Contractor can use for staging and as a laydown area during the construction process?**

   The CRA owns one (1) vacant lot located at 105 SW 5th Avenue, Delray Beach, FL 33444. The vacant lot is located near the Project site and may be utilized by the Contractor for staging and parking purposes during the construction phase of the Project. The terms for the temporary use of the vacant lot will be negotiated with the Awarded Bidder prior to the finalization of the Contract.

   If more space is needed, the Contractor will be responsible for finding additional space for staging and parking and contracting with private owners. Nearby public parking lots shall not be used for staging purposes or parking of heavy construction equipment.

---

9. **What is the correct finish for the aluminum storefronts and doors? The plans do not show the finish and the specifications provide both clear anodized satin silver and a kynar finish.**

   The finish for the storefronts and doors shall be a clear anodized satin silver finish.

---

10. **What is the correct glass required for this Project? The plans show 9/16" Atlantica green tint with Low E (SC=0.64 & U=1.0 or better). The specifications state insulated laminated glass with gray tint and low E. (U=0.57, VLT=30%, SHGC=0.25).**

    Insulated laminated glass with gray tint and low E. (U=0.57, VLT=30%, SHGC=0.25) shall be used for this Project.

---

11. **The plans list Trulite 351 door NOA number and Trulite 3100 system NOA numbers on sheet A-800. Yet the specifications do not call out Trulite as an option. The specifications list three other companies. Can we bid the Trulite systems?**

    Please use the Trulite information provided in the plans. The Truelite products provided in the plans were the Basis of Design for the Project.

---

12. **Cast in place concrete beam schedule shows FB3 called 16" wide (drawing no. S20), but on section details it measures 8" wide (drawing no. S21). Please confirm which size is correct.**

    Please use width of beam of 16".

---

13. **Sheet A-621 is missing from the ITB documents. Please provide missing sheet.**

    Sheet A-621 is attached to this Addendum.

---

14. **Are Bidders required to use the Bid Bond Form included in the ITB document on page 47-48. If so, the Bid Bond form is titled SAMPLE BID BOND. Is this correct? Please clarify.**

    The BID BOND has been revised and is attached to this Addendum. Bidders are required to use the revised BID BOND when submitting a Bid.

---

15. **There is no support beam at the 2nd floor stair landing (sheet S.20), but a support beam shows on (sheet A-620). Please clarify.**

    Sheet A-620 shows part of metal pan stair. The metal pan stair and landing are pre-engineered. Please refer to specification section #05 51 00 for details on the metal pan stairs (page 108 of the Specification file).

---

16. **Please confirm the roof minimum R-Value for the Lightweight Insulating Concrete.**

    The minimum R-Value required for the lightweight roof insulating concrete is R-20.

---

17. **FB1A shows on concrete beam schedule, but it does not show on the floor plan (Drawing S20), please clarify.**

    FB1A not used in the project. Drawing S20 is attached to this Addendum.

---

18. **F36 shows on the spread footing schedule, but it is not show on the floor plan (Drawing S10), please clarify.**

    F36 not used in the project. Drawing S10 is attached to this Addendum.

---

19. **C1 square appearance on the floor plan does not match with the square appearance of the column schedule (Drawing S10) , please clarify.**

    C1 is a square column sometimes with poured wall attached. Drawing S10 is attached to this Addendum.

---

20. **Two columns do not have marks (Drawing S10). Please clarify.**

    C1 at grid line 1D, wall at grid line 2B. Drawing S10 is attached to this Addendum.

---

21. **2nd floor and roof framing plans, (Drawings S20 and S30) show a note of the slab with #3 at 12" OC, but on detail 7 (Drawing S22), it shows reinforcement with #4. Please clarify.**

    Detail 7 (Drawing S22) revised. Drawing S22 is attached to this Addendum.

---

22. **Drawing S30 shows point arrow 9 (Drawing S31) does not match what shows in the detail, RB3. Please clarify.**

    Detail 9 (Drawing S31) revised. Drawing S31 is attached to this Addendum.

---

23. **Drawing S20 does not show what kind of beam goes by schedule or will it be considered a couble bond beam. Please clarify.**

    Use double bond beam unless FB shows on wall. Drawing S20 is attached to this Addendum.

ADDENDUM NO.1 ATTACHMENTS:

1. Bid Bond
2. Stormcapture Design Summary
3. Sheet A-621
4. Drawing S10-R1
5. Drawing S20-R1
6. Drawing S22-R1
7. Drawing S31-R1

BID BOND

STATE OF FLORIDA)
) SS
COUNTY OF _____)

KNOW ALL MY BY THESE PRESENTS that _____ as Principal, and _____ as surety, are held and firmly bound unto the Delray Beach Community Redevelopment Agency, Florida, hereinafter called the CRA in the penal sum of _____ dollars ( ) lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas the Principal has submitted the accompanying bid, dated _____, for project titled:

95 SW 5th Avenue Corridor Improvements
Design Build Construction Request for Proposals
ITB CRA No. 2022-01

NOW, THEREFORE,

(a) It is a condition precedent to the submission of said bid that a certified check, cashier's check or bid bond in the amount of five percent (5%) of the base bid be submitted with said bid as a guarantee that Bidder would, if awarded the contract, enter into a written contract with the CRA for the completion of the Work specified in the Contract Documents for the amount indicated in the Bid.

(b) If the Principal shall not withdraw said bond within (90) days after date of the same, and shall within (30) days after the prescribed forms are presented to him for signature, enter into a written contract with the CRA in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligation shall be void and of no effect, otherwise the sum herein stated shall be due and payable to the CRA and the surety herein agrees to pay said sum immediately upon demand of the CRA in good and lawful money of the United States of America as liquidated damages for failure thereof of said principal.

IN WITNESS WHEREOF, the above-bounded parties executed this instrument under their several seals, this _____ day of _____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

I _____ (person), on behalf of
(surety)
_____ (Surety Company) have read

and examined the Performance and Payment Bonds attached to Bid No._____.

_____ Date: _____
Signature

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses required). (If Corporation, Secretary Only will attest and affix seal)

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

PRINCIPAL

_____
(firm name)

By: _____
(Signature of Authorized Officer)

(affix Seal)

Print Name: _____

Title: _____

Business Address:
_____
_____
_____

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

SURETY

_____
(firm name)

By: _____
(Signature, Attorney-in-Fact)

(affix Seal)

Print Name: _____

Business Address
_____
_____
_____

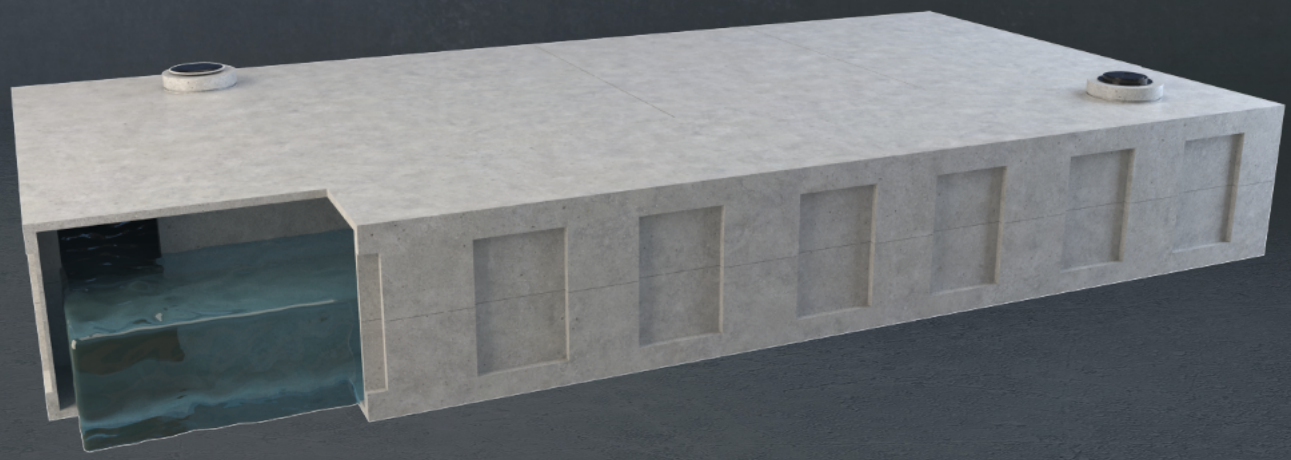
Name of Local Insurance Agency

_____

Oldcastle Infrastructure™
A CRH COMPANY

STORMCAPTURE®

Design Summary



PROJECT INFORMATION

PROJECT NAME: 95 SW 5th Ave

PROJECT CITY: Delray Beach

PROJECT STATE: FL

COMPANY: Miller Legg

SITE TYPE: Commercial

SYSTEM DESIGN

System Type:
| Detention

Module Construction Type:
| Base with Top Slab

Storage Volume Required (cf):
| 2000

Configured Storage Volume (cf):
| 2245

System Internal Height (ft):
| 3

Nominal Module Capacity (cf):
| 315

Required Number of Modules:
| 7

Module Designation:
| SC1 0-3

SITE DESIGN

System Invert Elevation (ft):
| 9.25

Top of Module Elevation (ft):
| 12.85

Maximum Rim Elevation (ft):
| 14.50

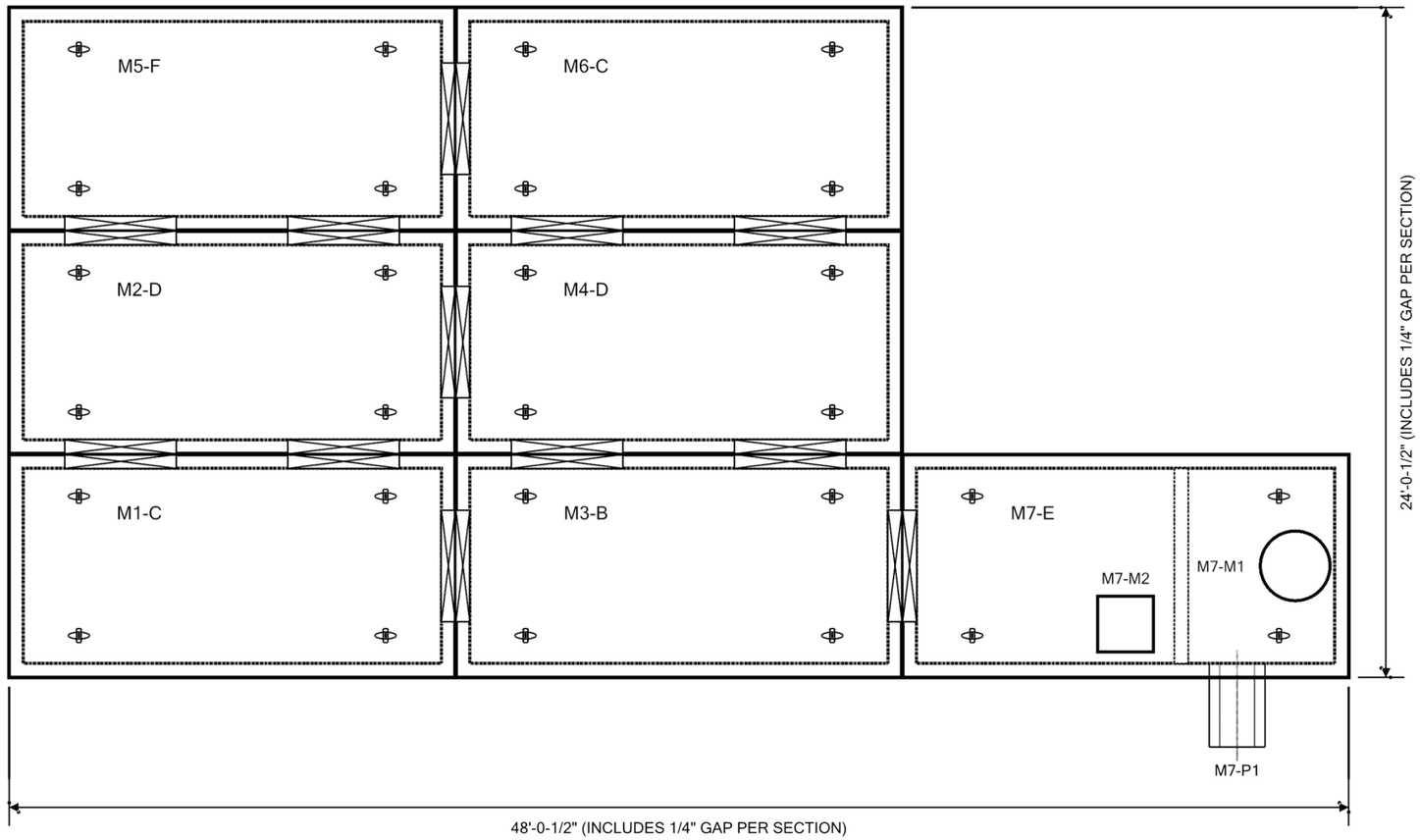
Depth of Cover (ft):
| 1.65

Minimum Inlet Elevation (ft):
| 0.00

Maximum Inlet Elevation (ft):
| 0.00

Minimum Outlet Elevation (ft):
| 8.00

Maximum Outlet Elevation (ft):
| 8.00



PLAN VIEW
SCALE: 3/16" = 1'-0"

MODULE NOTES		
TYPE	QUANTITY	HEIGHT
C	2	3
D	2	3
B	1	3
F	1	3
E	1	3
TOTAL	7	
VOLUME	2245	CUBIC FEET

PIPE SCHEDULE		
PIPE	SIZE	INVERT
M7-P1	15" RCP	8.00'

MANHOLE SCHEDULE		
MANHOLE	TYPE	RIM
M7-M1	30" DIA. F&C	14.50'
M7-M2	24" F&G	14.50'

DESIGN NOTES:
1. DESIGN LOADINGS:
   - A. AASHTO HS-20-44 W/ IMPACT.
   - B. DEPTH OF COVER = 6" - 5'-0" (120 PCF ASSUMED).
   - C. ASSUMED WATER TABLE = BELOW BOTTOM OF PRECAST.
   - D. DRY LATERAL EARTH PRESSURE (EFP) = 45 PCF.
   - E. LATERAL LIVE LOAD SURCHARGE = 80 PSF (APPLIED TO 8' BELOW GRADE).
   - F. NO LATERAL SURCHARGE FROM ADJACENT BUILDINGS, WALL PIERS, OR FOUNDATIONS.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE 6,000 PSI.
3. STEEL REINFORCEMENT: REBAR, ASTM A-615 OR A-706, GRADE 60.
4. MESH REINFORCEMENT: ASTM A-1064, S1.2, GRADE 80.
5. CEMENT: ASTM C-150 SPECIFICATION.
6. STORMCAPTURE MODULE TYPE = DETENTION
7. REQUIRED BASE LAYER DEPTH = NOT APPLICABLE.
8. REQUIRED NATIVE ALLOWABLE SOIL BEARING PRESSURE = 2,500 PSF. NATIVE SOIL SHOULD BE LEVEL/SCREEDED AND COMPACTED ADEQUATELY TO ALLOW FOR REQUIRED BEARING CAPACITY.
9. REFERENCE STANDARDS:
   - A. ASTM C 890
   - B. ASTM C 891
   - C. ASTM C 913
10. CONSTRUCTION EQUIPMENT EXCEEDING DESIGN LOADING SHALL NOT BE ALLOWED ON STRUCTURE. ANY DESIGN CONSTRAINT DIFFERENT FROM ABOVE REQUIRES CUSTOM STRUCTURAL DESIGN AND MAY REQUIRE THICKER SUBGRADE AND REVISED PRICING.

NOTES TO REVIEWING ENGINEER:
1. THIS SYSTEM IS DESIGNED TO THE PARAMETERS NOTED. PLEASE VERIFY THAT THESE PARAMETERS MEET PROJECT REQUIREMENTS (I.E. LIVE LOAD AND FILL RANGE). IF DESIGN PARAMETERS ARE INCORRECT NOTIFY OLDCASTLE IMMEDIATELY FOR REDESIGN AND RE-PRICING.
2. ENGINEER OF RECORD TO CONFIRM ALL PIPE PENETRATION LOCATIONS, SIZES, AND INVERTS.
3. ENGINEER OF RECORD TO CONFIRM ALL MANWAY ACCESS LOCATIONS AND RIM ELEVATIONS.
4. UNLESS OTHERWISE NOTED, ALL PIPE SUPPLIED AND INSTALLED BY OTHERS.
5. THIS SYSTEM IS DESIGNED FOR A GROUNDWATER TABLE BELOW SYSTEM INVERT. ENGINEER OF RECORD TO VERIFY THAT THE DESIGN GROUNDWATER TABLE IS BELOW INVERT OF PRECAST. IF DESIGN PARAMETERS ARE INCORRECT NOTIFY OLDCASTLE IMMEDIATELY FOR REDESIGN AND REVISED PRICING.
6. THIS SYSTEM IS DESIGNED WITHOUT A CONTAINMENT MEMBRANE LINER. IF A LINER IS NEEDED PLEASE CONTACT OLDCASTLE TO PROVIDE THIS OPTION IN THE FINAL DESIGN.

Detention/ Infiltration

- PRELIMINARY – NOT FOR CONSTRUCTION

Oldcastle Infrastructure™ A CRH COMPANY

Ph: 800.579.8819 | www.oldcastleinfrastructure.com/stormwater

THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE INFRASTRUCTURE, INC. IT IS CONFIDENTIAL, SUBMITTED FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED IN ANY WAY INJURIOUS TO THE INTERESTS OF, OR WITHOUT THE WRITTEN PERMISSION OF OLDCASTLE INFRASTRUCTURE, INC. COPYRIGHT © 2019 OLDCASTLE INFRASTRUCTURE, INC. ALL RIGHTS RESERVED.

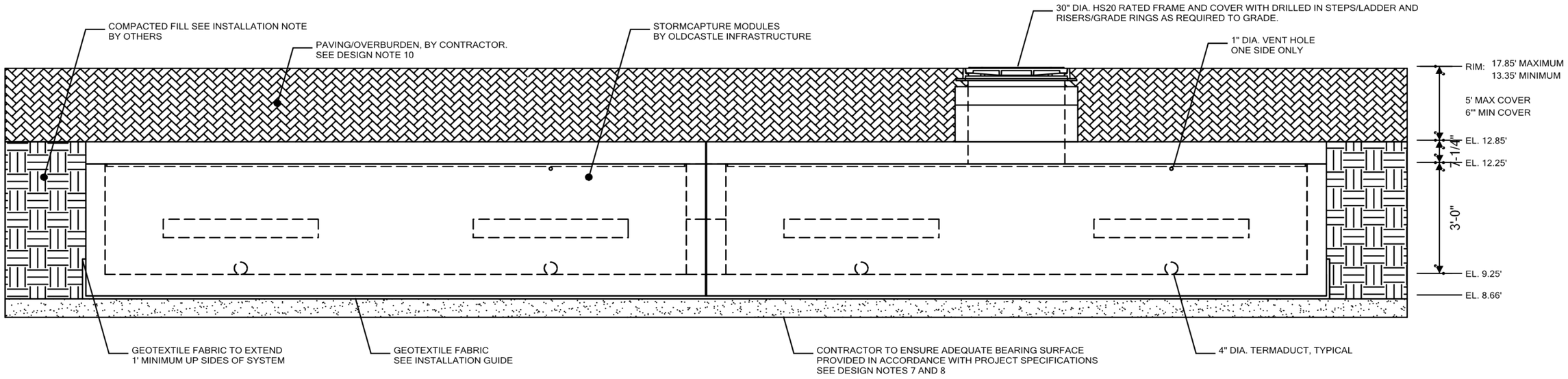
STORMCAPTURE ®

SC1 DETENTION SYSTEM

CUSTOMER:
Miller Legg

JOB NAME & LOCATION:
95 SW 5th Ave - Delray Beach,FL

DRAWING NUMBER	REVISION	SHEET
WSCDD-739-0_SC1_DT	-	1 OF 2
	REV DATE 8/6/20	



NOTE:
TERMADUCT INSERTS TO BE KNOCKED OUT
AT SPECIFIED LOCATIONS ONLY (BY OTHERS)

TYPICAL ELEVATION
SCALE: 3/8" = 1'-0"

- PRELIMINARY –
NOT FOR CONSTRUCTION

Oldcastle Infrastructure™
A CRH COMPANY

Ph: 800.579.8819 | www.oldcastleinfrastructure.com/stormwater

THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE INFRASTRUCTURE, INC.
IT IS CONFIDENTIAL, SUBMITTED FOR REFERENCE PURPOSES ONLY AND
SHALL NOT BE USED IN ANY WAY INJURIOUS TO THE INTERESTS OF, OR
WITHOUT THE WRITTEN PERMISSION OF OLDCASTLE INFRASTRUCTURE, INC.
COPYRIGHT © 2019 OLDCASTLE INFRASTRUCTURE, INC. ALL RIGHTS RESERVED.

STORMCAPTURE ®

SC1 DETENTION SYSTEM

CUSTOMER:
Miller Legg

JOB NAME & LOCATION:
95 SW 5th Ave - Delray Beach,FL

DRAWING NUMBER	REVISION	SHEET
WSCDD-739-0_SC1_DT	-	2 OF 2
	REV DATE 8/6/20	

Detention/
Infiltration

STORMCAPTURE®

Installation Manual

Water

Oldcastle Infrastructure™
A CRH COMPANY

INTRODUCTION

SITE PREPARATION

DELIVERY & INSTALLATION

LINKSLABS

BACKFILL

INTRODUCTION

StormCapture (shown in **Figure 1**) is a total storm water management system. The highly-configurable module has many solutions for detention, retention, infiltration, treatment and harvesting. Multiple modules can be arranged into endless formations to meet the needs of even the most challenging sites. The rectangular design facilitates rapid and easy installation, plus stress-free maintenance. The precast concrete provides long-term reliability and low lifecycle costs.

The engineer of record is responsible for reviewing and approving the system design, storage volume, required depth of cover, vehicular loading, water table elevation, backfill material and soil bearing capacity. Any variations found during construction to those stated on the plans must be reported to the engineer and Oldcastle Infrastructure.

This manual is not intended to be all-inclusive and is a reference guide only.

FIGURE 1

Detention System

Single Module

FIGURE 2

StormCapture System During Installation Process

SITE PREPARATION

TIMING

- Excavation and subgrade shall be completed prior to StormCapture delivery.

EXCAVATION (See **Figures 3 & 4**)

- Depth
  Concrete invert: Depth of fill* + Module outside height + 2" subgrade depth
  Open bottom: Depth of fill* + Module outside height + subgrade depth**
  ** 6" minimum, 5' maximum, unless otherwise noted*
  *** Subgrade depth determined in accordance with StormCapture Tech Note SC-01*
- Excavation shall be large enough to allow access around structure for backfilling and compaction equipment.
- Trench sloping shall follow OSHA requirements.
- To prevent excessive water pressure build up on the outside of the modules, the site must be prepared and graded for proper drainage around the StormCapture system.
- Dewatering is required when water level is above bottom of subgrade.

SUBGRADE (See **Figures 3 & 4**)

1 Native soil shall be level and compacted adequately to allow for required bearing capacity on design documents.

2 Add 2" of sand for leveling purposes.

3 Geotextile fabric and containment membrane liner.

- An 8 oz. non-woven geotextile fabric must be used as a separation layer around the StormCapture system.
- When the project requires a containment membrane liner, a layer of 8 oz. non-woven geotextile fabric must be used on both the inside and outside face of the liner.
- Install containment membrane liner per manufacturer's recommendations.

4 Aggregate bearing layer (See **Figure 3**)

- Open-bottom modules only are required to be placed on a crushed aggregate bearing layer to a depth in accordance with StormCapture Tech Note SC-01. Material shall be clean, durable crushed aggregate compacted as directed by the engineer of record. Oldcastle recommends size 5, 56 or 57 (per ASTM C33).
- Extend aggregate bearing layer a minimum of 1' around the system perimeter.
- Aggregate bearing layer must be level and compacted prior to module placement.
- An 8 oz. non-woven geotextile fabric must be used as a separation layer around the aggregate material and StormCapture system.

Note: *Further investigation by a geotechnical engineer may be required where there are concerns with seasonally high water table, and/or poor soil conditions such as low allowable bearing capacity, permafrost and seasonal freeze/thaw cycles.*

FIGURE 3

- 1-Piece Module - With Liner

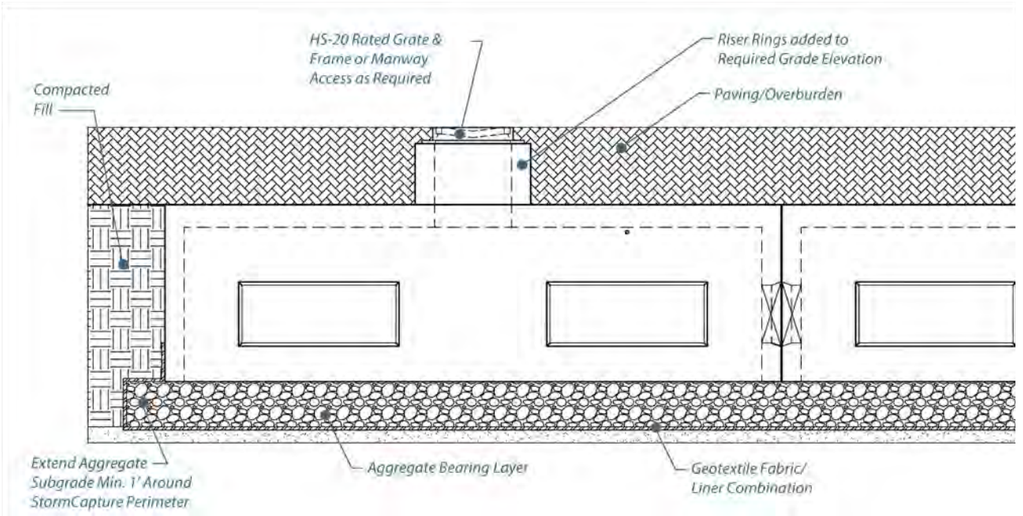
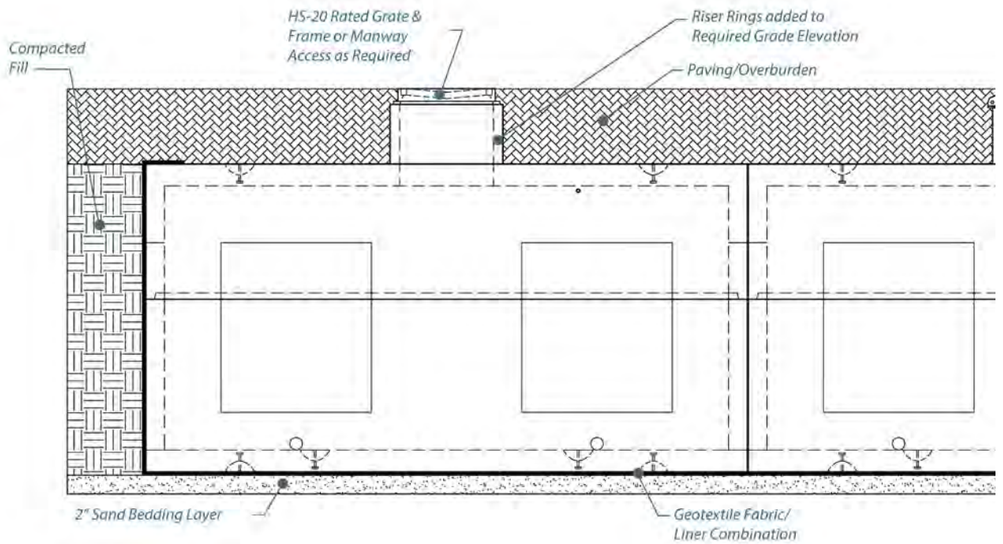


FIGURE 4

- 2-Piece Module - With Liner



DELIVERY & INSTALLATION

StormCapture modules are to be installed in accordance with ASTM C891-90, Installation of Underground Precast Utility Structures. Project plan and specifications must be followed along with any applicable regulations.

TIMING

- Plan for first delivery of StormCapture modules after site preparation is completed.
- Individual pieces can be installed in as little as 10 minutes.

DELIVERY

- Verify that equipment can handle module weights as noted on construction documents prior to delivery.
- StormCapture modules will be delivered on flatbed trucks.

HANDLING

- StormCapture modules are lifted by the designed embedded lifers at points provided by Oldcastle (**Figure 5**).
- Designed embedded lifters must be used. Use proper rigging to assure all lifters are equally engaged with a minimum 60° angle on slings (**Figure 6**).
- Special lifting clutches are required and shall be coordinated with the producing plant.
- Always follow safety protocols for handling StormCapture modules during installation as illustrated on this page.
- Never stand under load (**Figure 7**).
- Never place hands in the lift gear (**Figure 8**).
- Never place hands under load (**Figure 9**).

PLACEMENT

- Use the plan line, grade and elevations shown on the construction documents to install the modules. The sand bedding or aggregate bearing layer must be level.
- Modules must be placed as close together as possible with gaps no greater than 3/4".
- All vertical & top joints shall be covered with an 8" minimum width self-adhesive joint wrap as shown in **Figure 10**.
- Horizontal joints between modules or slabs shall be sealed with Conseal CS-102 butyl rubber sealant as shown in **Figure 11**.
- Seal pipe penetrations to containment membrane liner with pipe boots per liner manufacturer's recommendations.

FIGURE 5

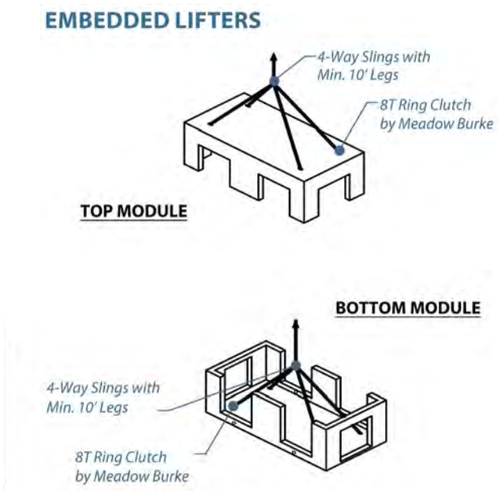


FIGURE 6

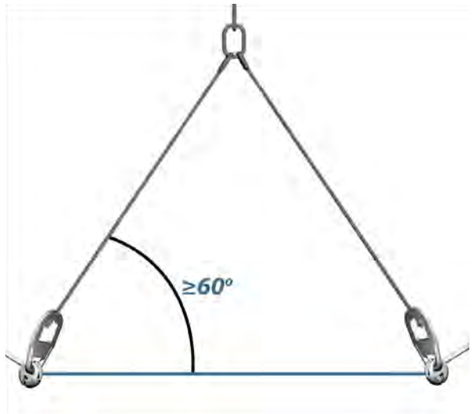


FIGURE 7

FIGURE 8

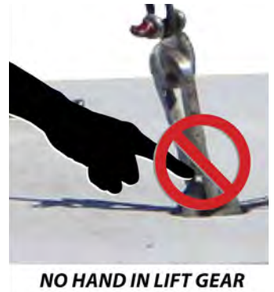


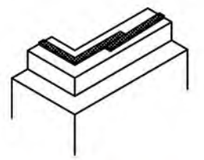
FIGURE 9

FIGURE 10

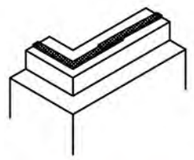
- Sealed Joints Between Modules

FIGURE 11

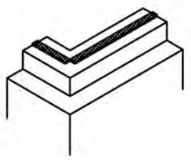
Keyways must be free of dirt, rocks and water. Rocks and dirt prevent the vault sections from seating and sealing properly. Remove all protective paper from rubber sealant material. Splice rubber sealant material with a "side by side" joint, away from corners. Corner splicing will not seal properly.



CORRECT - Install rubber sealant material at the outer edge of the keyway. Rubber sealant should be continuous around corners.



INCORRECT - Do not overlap the rubber sealant material at splice.



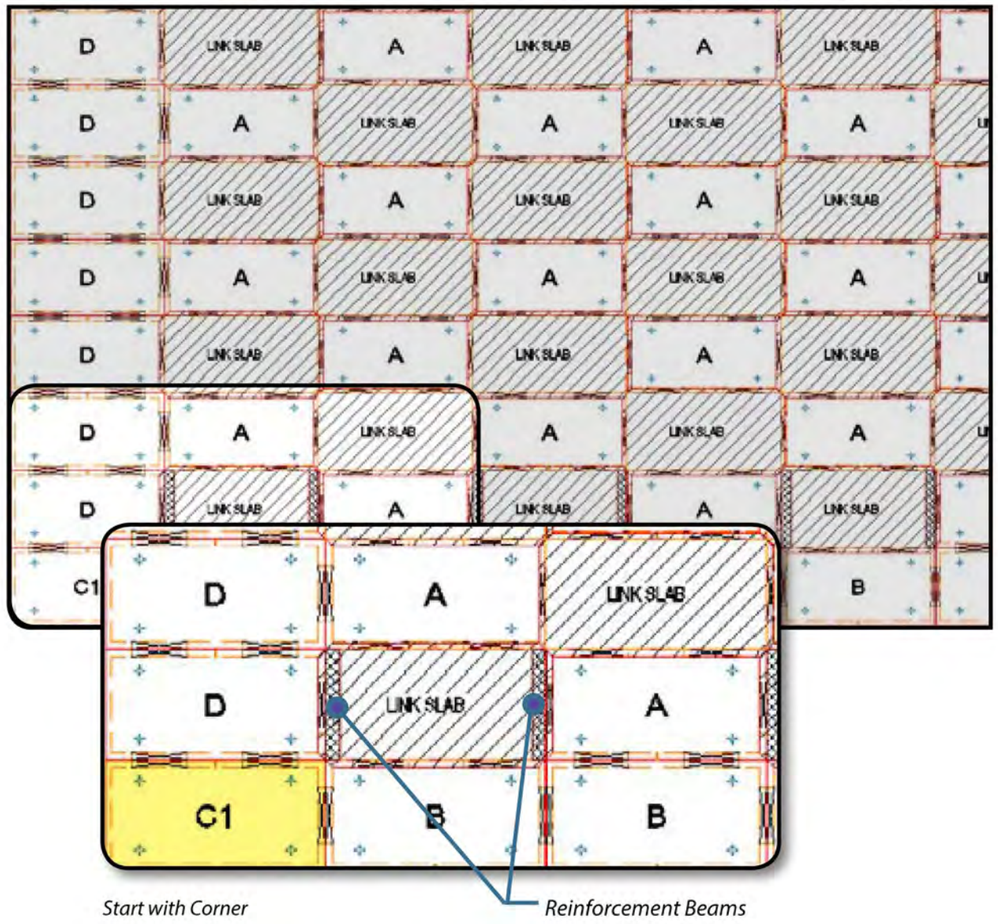
INCORRECT - Do not overlap the rubber sealant material at a corner. Rubber sealant should be continuous around corners.

LINKSLAB® PROCEDURE

These procedures reference the diagram below. This diagram is not indicative of all site layouts. Refer to the site plan for the project specific configuration.

FIGURE 12

Example Layout



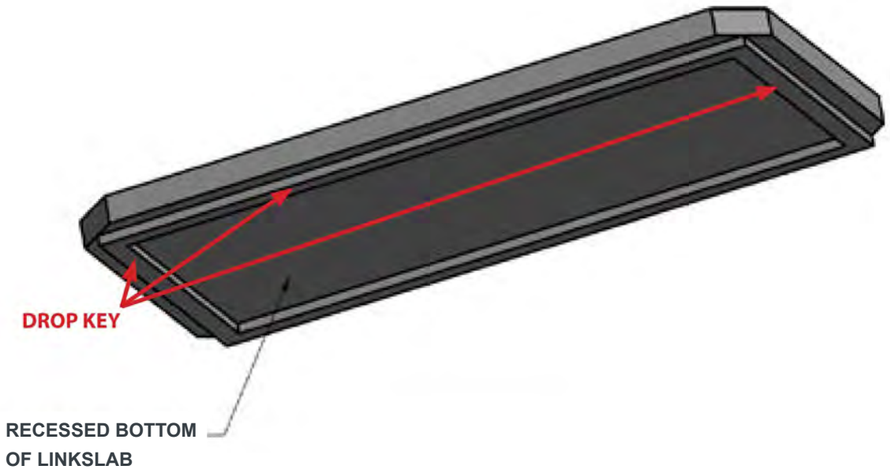
LINKSLAB PROCEDURE

Maintaining proper line and grade is critical to installation. A qualified surveyor on the site with proper equipment is recommended to ensure a square, level and straight layout. Subgrade must be compacted.

1 Start in the corner of the layout and place the first bottom module C1.
2 Place adjacent bottom modules B, B, D, D. Be sure to set the corners square and straight (from C1 up with D modules, and from C1 right with B modules).
3 Where called out on plans, place reinforcement beams between the modules where the LinkSlab will sit (between B and A). Reinforcement beams may not be required at all locations, so refer to the project specific configuration.
4 Place interior modules A, A.
Check the distance between pieces when there is a gap for a LinkSlab. Both bottom corners should be between 8' and 8'-1 ¼".
5 Place Conseal CS-102 at the horizontal joints.
6 Place top modules (C1, B, B, D, D, A, A).
Check the distance between pieces when there is a gap for a LinkSlab. Both top corners should be 8' and 8'-1 ¼".
7 Place Conseal CS-102 for the horizontal LinkSlab joints at D, A, A and B.
8 Place the LinkSlab. Ensure that it fits tightly between all adjacent modules. The drop key should fit inside the adjacent modules. Do not allow the LinkSlab to rest on the drop key.
Ensure surface contact with the bottom of the LinkSlab and the top of the adjacent modules. Reset adjacent modules as necessary to correct the problem.
9 Continue placing adjacent modules and LinkSlabs.
Oldcastle Precast recommends placing each LinkSlab as soon as the supporting modules are in place to ensure proper fit.
10 Continue installation procedure as recommended in the StormCapture Installation Manual.

FIGURE 13

LinkSlab Isometric View



BACKFILL

Once all modules are in place with joints sealed and geotextile fabric wrapped, the StormCapture system shall be inspected by the engineer of record or an accepted representative. Upon approval, backfilling can begin.

- Do not compact within 6" of module to avoid damaging the system. Care shall be taken during placement of backfill not to displace modules, joint wrap, containment membrane liner or geotextile fabric.
- Backfilling shall be in 1' lifts with proper compaction between lifts. Typical backfill shall be compacted to 95% standard proctor density or as specified.
- Expansive soil material shall not be used as backfill around the structure.
- Compaction shall be adequate to support expected loads on top of the system and surrounding area. Consult with geotechnical engineer for the project.
- Once installed, StormCapture modules are ready for paving or overburden material (**Figure 14**).
- Finished grading, paving and landscaping shall be per construction documents.
- Construction equipment exceeding design loading shall not be allowed on structure. Consult Oldcastle Infrastructure if unsure.
- Contact Oldcastle Infrastructure and the engineer of record if the live loads are greater than HS-20.
- Track vehicles including D-4 type dozers or lighter are permitted.

INSTALLATION IS NOW COMPLETE

Project specific conditions may apply. Please refer to design documents for any special circumstances regarding installation or infiltration. ***Oldcastle Infrastructure is not liable for installation.***

FIGURE 14

- Backfill

PRECONSTRUCTION MEETING CHECKLIST

Project Name: _____ Date: _____ Time: _____

Installer Name: _____ Address: _____

Oldcastle Rep: _____ _____

- ☐ Cover the installation manual
- ☐ Installer has the **approved** drawings
- ☐ Crane sizing and proper rigging
- ☐ Coordinate with installer to borrow lifting clutches for installation
  - ☐ Recommend $1,600 deposit (paid to plant from contractor), with money to be repaid upon return of undamaged clutches.
- ☐ Hole sizing
  - ☐ Extra space for liner weld if needed
- ☐ Hole prep (base prep)
- ☐ Liner (if applicable)
  - ☐ Extra hands for unrolling liner needed
- ☐ Project date of install: _____
- ☐ Delivery truck access to the site
  - ☐ Will a truck with a sleeper cab fit?
  - ☐ Do construction site items need to be moved for access?
- ☐ Timing of trucks
  - ☐ Splash pads first
  - ☐ Order of modules to install with ease
  - ☐ Assume 10-15 minutes per piece
- ☐ Installing of modules
- ☐ Joint Wrap
- ☐ Other: _____

SIGNATURES:

Project Superintendent: _____ Other: _____

Project Foreman: _____ Other: _____

OUR MARKETS

Building Structures

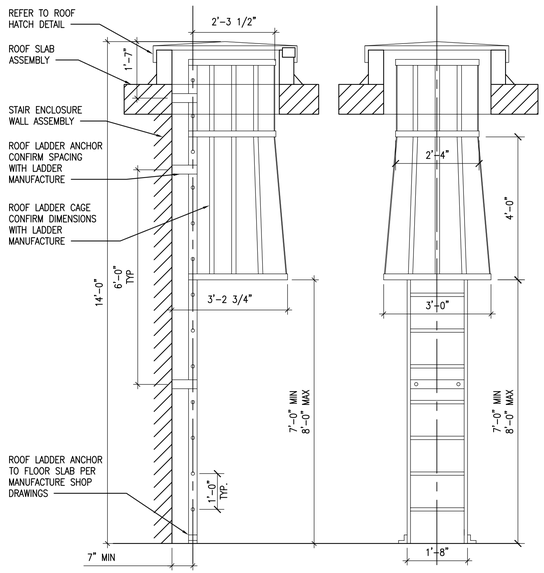
Communications

Water

Energy

Transportation

Oldcastle Infrastructure™
A CRH COMPANY

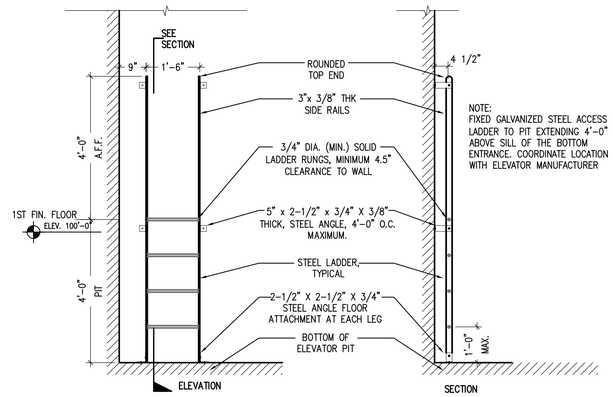


ROOF ACCESS LADDER DETAIL

03

– –

1/2"=1'-0"

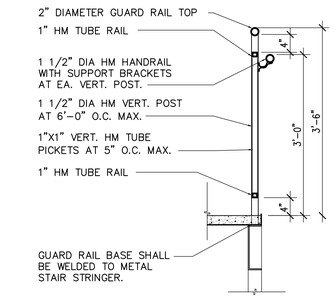


ELEVATOR PIT LADDER DETAIL

02

– –

1/2"=1'-0"



RAILING PROFILE DETAIL

01

– –

3/4"=1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI

LICENSE#: AR98054

DATE: 08–11–2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

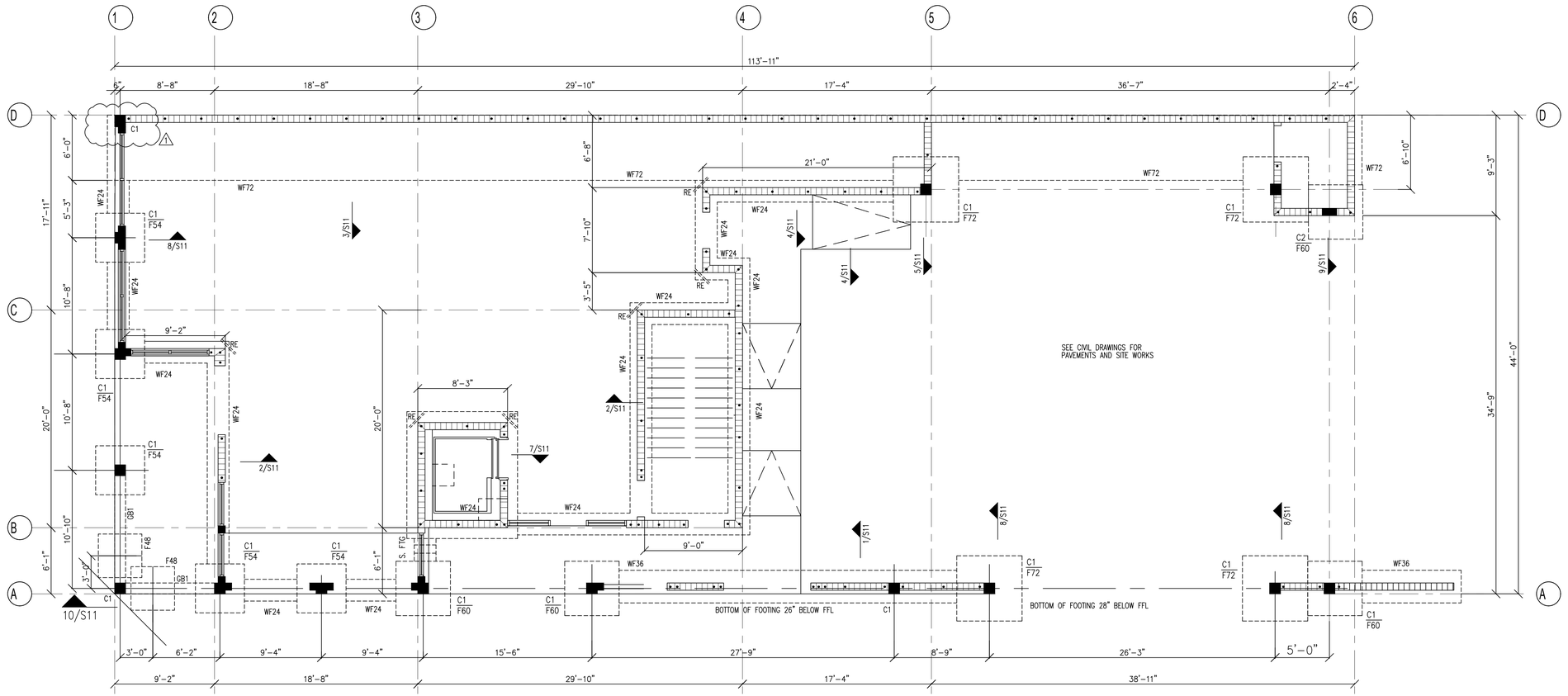
Key Plan:

Date : 01–05–2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
STAIR AND ELEVATOR SECTIONS

Sheet # :
A-621



FOUNDATION LAYOUT

SCALE 3/16" = 1'-0"

LEGEND:

FOR GENERAL STRUCTURAL NOTES SEE DRAWING S01

- WF = CONTINUOUS FOOTING, SEE SCHEDULE.
- C1, C2 CONCRETE COLUMNS
- GB1 12"x20" DEEP GRADE BEAM, 6#8T, 3#8B, #3 STIRRUPS AT 6" O.C.
- S. FTG STEPPED FOOTING
- TOF TOP OF FOOTING
- BOF BOTTOM OF FOOTING
- CJ CONTROL JOINT IN SLAB
- RE = RE-ENTRANT BARS. 2#4 x 6'-0" LONG AT MIDDLE OF SLAB SECTION.
- REINFORCED MASONRY WALL

1 — C1 — 8" WIDE REINFORCED CONCRETE WALL AT C1 WITH 2#5 VERTICAL BARS, 1" COVER COORDINATE LENGTH WITH ARCH DWGS

8"x8" REINFORCED CONCRETE WALL AT GRID LINE 2B WITH 4#5 VERTICAL BARS, 1" COVER

FOUNDATION PLAN NOTES:

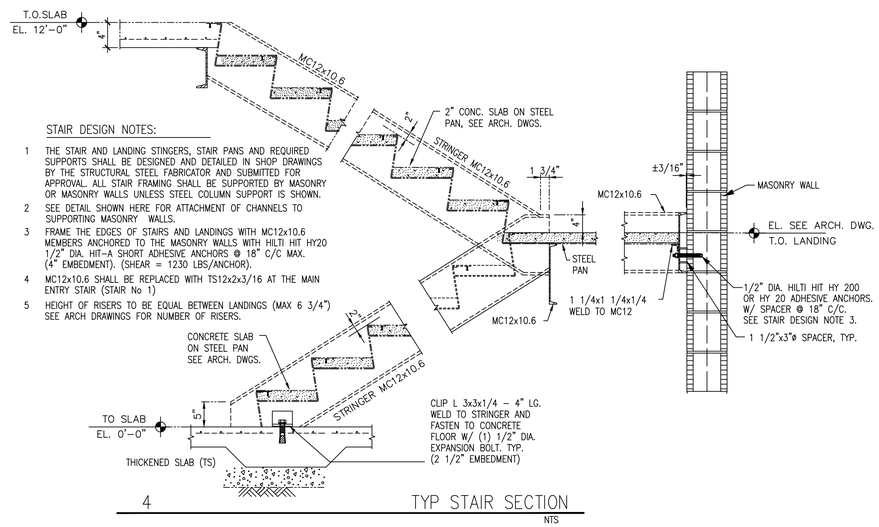
1. ALLOWABLE NET SOIL BEARING CAPACITY = 2500 PSF. THE CONTRACTOR IS TO CONFIRM THIS BEFORE EXCAVATING.
2. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER.
3. SEE S11 FOR TYPICAL FOUNDATION DETAILS. TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS OTHERWISE NOTED.
4. F**... ETC INDICATES CONCRETE FOOTING. e.g. F36 INDICATES A FOOTING 36" SQUARE
5. VERIFY BEARING CAPACITY AT BOTTOM OF FOOTING EXCAVATIONS PRIOR TO PLACING CONCRETE. INSPECTOR TO VERIFY AND REPORT PLACEMENT OF REINFORCING STEEL PRIOR TO PLACEMENT OF CONCRETE.
6. REINFORCING AT CORNERS IN FOOTINGS PER DETAIL C/S11 TO MAINTAIN CONTINUOUS REINFORCING.
7. COORDINATE WITH OTHER CONTRACT DOCUMENTS FOR INSTALLATION OF ALL REQUIRED SLEEVES, INSERTS, ETC. UNDER THE CONCRETE FOOTINGS.
9. FOR SLAB ON GRADE DETAILS, SEE A/S11.
10. PROVIDE CONTROL JOINTS IN THE SLAB ON GRADE TO FORM NEAR SQUARE PANELS AS SHOWN.
11. CENTERLINE OF FOOTING TO MATCH CENTERLINE OF COLUMN UNO
12. MAINTAIN SLAB DEPTH AT SLOPED SLABS.
13. GROUT SOLID MASONRY BELOW FIRST FLOOR F.F.L.

CONT. WALL FOOTING SCHEDULE		
MARK	FOOTING SIZE WxD	REINFORCING
WF24	2'-0"x12" CONT.	3-#5 L.W. CONT. + #5 @ 15" S.W. BOT.
WF36	6'-0"x12" CONT.	4-#5 L.W. CONT. + #5 @ 12" S.W. BOT.
WF72	6'-0"x16" CONT.	7-#5 L.W. CONT. + #5 @ 12" S.W. T&B

SPREAD FOOTING SCHEDULE		2500 PSF	
MARK	FOOTING SIZE	REINFORCING	REMARKS
F36	NOT USED		
F48	4'-0"x4'-0"x12"	5#5 BOT. E.W.	
F54	4'-6"x4'-6"x12"	5#5 BOT. E.W.	
F60	5'-0"x5'-0"x13"	7#4 BOT. E.W.	
F72	6'-0"x6'-0"x14"	7#5 BOT. E.W.	

TOP OF FOOTINGS SHALL BE 12" BELOW GRADE OR FFL

CONCRETE COLUMN SCHEDULE				
MARK	SIZE	MAIN (VERTICAL) REINFORCING	#3 TIE SPACING	REMARKS
C1	12" x 12"	4#8	12"	
C2	8" x 16"	6#6	8"	

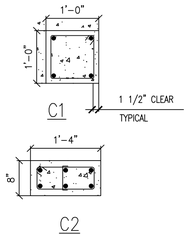


STAIR DESIGN NOTES:

1. THE STAIR AND LANDING STINGERS, STAIR PANS AND REQUIRED SUPPORTS SHALL BE DESIGNED AND DETAILED IN SHOP DRAWINGS BY THE STRUCTURAL STEEL FABRICATOR AND SUBMITTED FOR APPROVAL. ALL STAIR FRAMING SHALL BE SUPPORTED BY MASONRY OR MASONRY WALLS UNLESS STEEL COLUMN SUPPORT IS SHOWN.
2. SEE DETAIL SHOWN HERE FOR ATTACHMENT OF CHANNELS TO SUPPORTING MASONRY WALLS.
3. FRAME THE EDGES OF STAIRS AND LANDINGS WITH MC12x10.6 MEMBERS ANCHORED TO THE MASONRY WALLS WITH HILTI HIT HY20 1/2" DIA. HIT-A SHORT ADHESIVE ANCHORS @ 18" C/C MAX. (4" EMBEDMENT). (SHEAR = 1230 LBS/ANCHOR).
4. MC12x10.6 SHALL BE REPLACED WITH TS12x2x3/16 AT THE MAIN ENTRY STAIR (STAIR No 1)
5. HEIGHT OF RISERS TO BE EQUAL BETWEEN LANDINGS (MAX 6 3/4") SEE ARCH DRAWINGS FOR NUMBER OF RISERS.

4 TYP STAIR SECTION

NTS



Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 26263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FOUNDATION LAYOUT

Sheet # :
S10

FLOOR PLAN NOTES:

1. CONCRETE JOISTS BY JOIST MANUFACTURER PER PCI SPECS. PRE-ENGINEERED PRESTRESSED JOISTS TO BEAR ON BEARING PADS AND SPACED PER THE P.C. JOIST MANUFACTURER.
2. ROOF JOIST SHALL BE 16" DEEP PRESTRESSED, PRECAST CONCRETE JOISTS (J16) AT 4'-6" O.C. MAXIMUM UNO.
3. FLOOR SLAB: 4" NJW CAST IN PLACE REINFORCED CONCRETE SLAB WITH #3 AT 12" O.C. TOP AND BOTTOM, EACH WAY, 3/4" COVER.
4. WALLS SHOWN ARE BEARING WALLS AND NON-LOADBEARING WALLS UNDER THE LEVEL SHOWN. FOR WALLS ABOVE THIS LEVEL, SEE STRUCTURAL LEVEL ABOVE AND THE ARCHITECTURAL DRAWINGS.
5. SEE GENERAL STRUCTURAL NOTES ON S01.

LEGEND

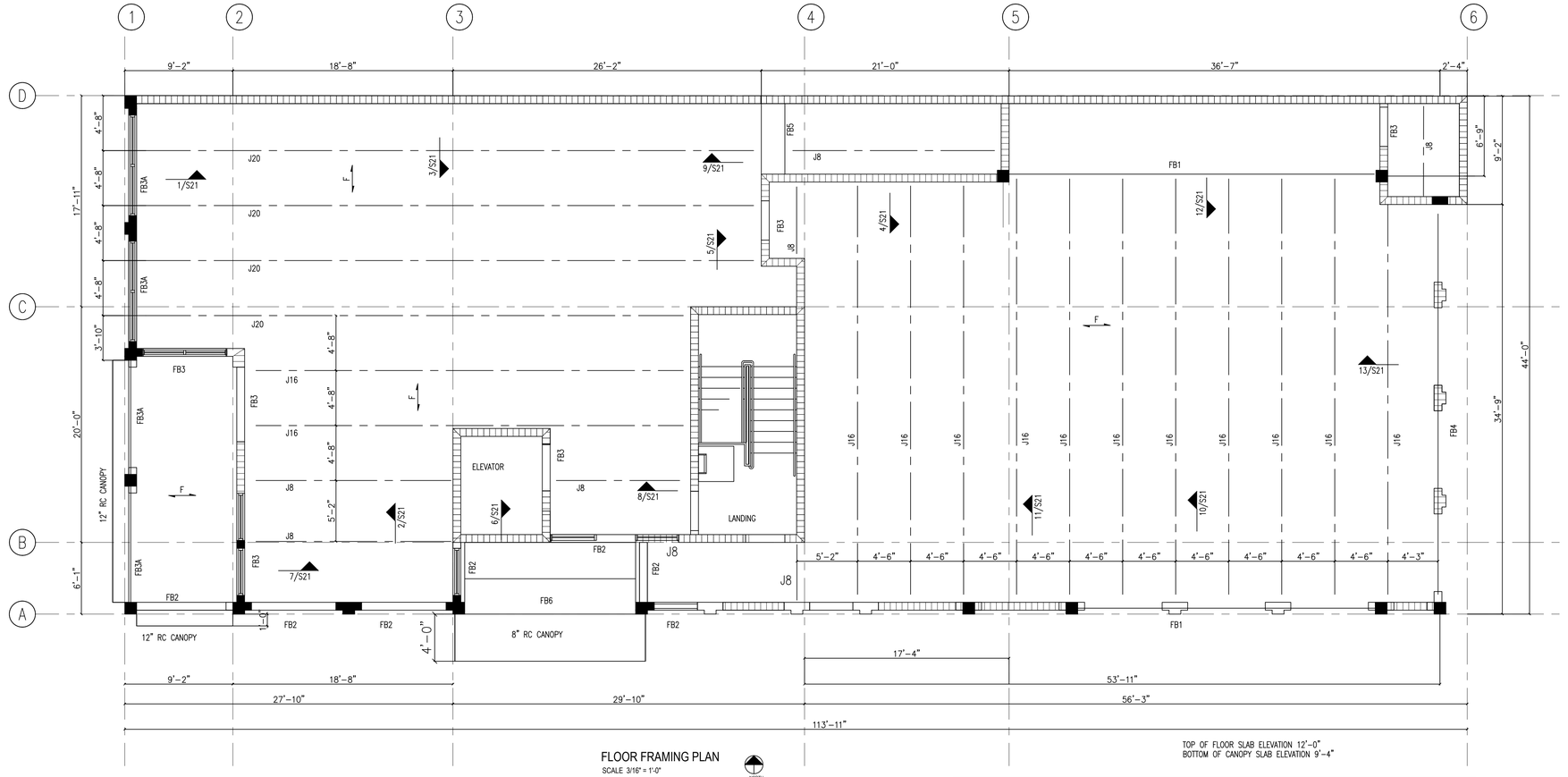
F — INDICATES DIRECTION OF FLOOR SPAN

J8 8" PRECAST JOIST

J16 12" PRECAST JOIST

J20 20" PRECAST JOIST

TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.



FLOOR FRAMING PLAN

SCALE 3/16" = 1'-0"

NORTH

TOP OF FLOOR SLAB ELEVATION 12'-0"
BOTTOM OF CANOPY SLAB ELEVATION 9'-4"

CAST IN PLACE CONCRETE BEAM SCHEDULE

MARK	SIZE BxD	TOP REBAR	BOTTOM REBAR	#3 STIRRUP SPACING, INCH	COMMENT	ULTIMATE MOMENT Kip-FT	ULTIMATE SHEAR Kips	SHEAR FRICTION BARS
FB1	16"x32"	4#6			SOFFIT BEAM	435	68	3#6
FB1A	NOT USED							
FB2	8"x32"	2#6	2#6	14				
FB3	16"x29 1/2"	3#6	2#6	14				
FB3A	16"x32"	3#6			SOFFIT BEAM	71	24	3#5
FB4	16"x32"	4#6			SOFFIT BEAM	424	50	3#6
FB5	24"x30 1/2"	3#6			SOFFIT BEAM	85	17	3#5
FB6	36"x8"	4#8	8#8		SLAB/BEAM			

PROVIDE 16" EMBEDMENT INTO EACH SOFFIT BEAM TO #5 SHEAR FRICTION BARS
PROVIDE 20" EMBEDMENT INTO EACH SOFFIT BEAM TO #6 SHEAR FRICTION BARS

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

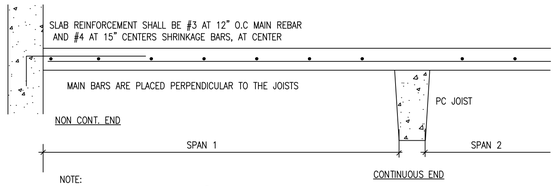
1	RFI #2	10/6/22

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

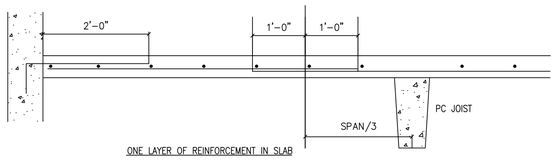
Sheet Title :
FLOOR FRAMING PLAN

Sheet # :
S20



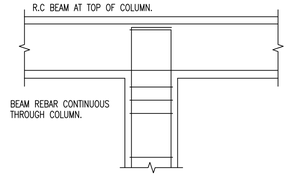
NOTE:
ELEVATED, ROOF SLAB SHALL BE 3" THICK, NORMAL WEIGHT CONCRETE WITH 6" AVERAGE CELLULAR CONCRETE TOPPING. MECH/ELEC CONSULTANT TO CONFIRM TOPPING THICKNESS. SEE PLANS FOR SLAB SUPPORT SPACING.

11 ELEVATED ROOF SLAB REINFORCEMENT DETAIL, TYP
NTS

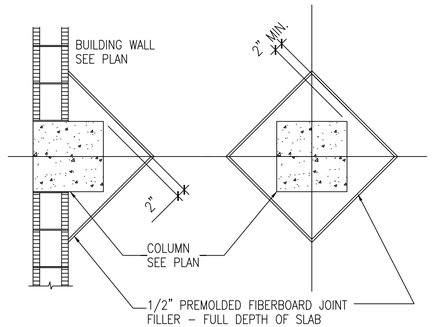


NOTE:
1. LENGTH OF LAP FOR #4 BARS SHALL BE 24 INCHES.
2. TRANSVERSE BARS MAY BE LAPPED AT ANY LOCATION

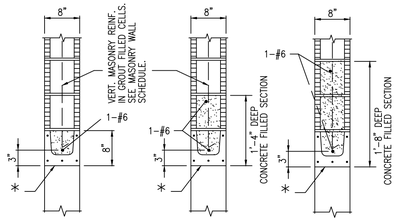
A LAPS FOR SLAB REINFORCEMENT
NTS



5A RC COLUMN DETAILS
TOP OF COLUMN AT CONTINUOUS BEAM
NTS



9 COLUMN ISOLATION JOINT DETAILS
NTS



* PRECAST CONCRETE LINTEL AS MANUFACTURED BY CAST-CRETE, OR APPROVED EQUAL. WITH 8" BEARING EACH END. ENDS TO HAVE 5 1/2" LONG x 4" WIDE NOTCH TO ACCOMODATE VERTICAL REINFORCING AND GROUTING. – TYPICAL.

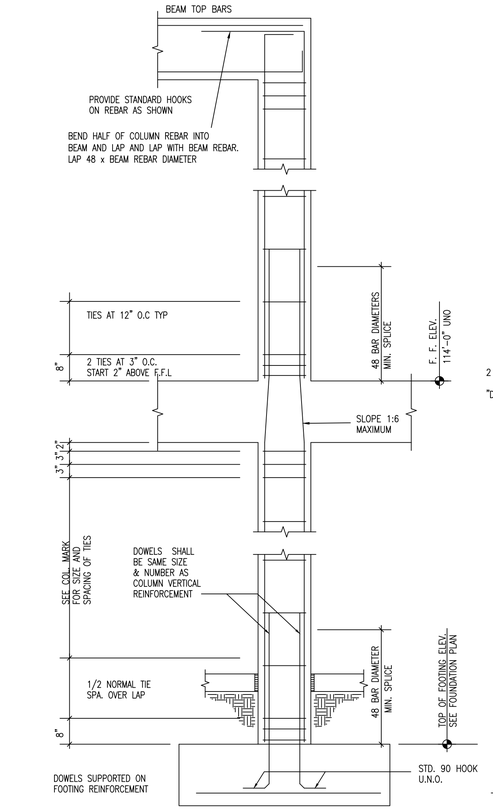
NOTES:
1. GROUT SOLID ALL MASONRY UNITS AS SHOWN.
2. ALL REINFORCING BARS HAVE STANDARD HOOKED AT THEIR ENDS
3. CMU SHALL BE 8" NORMAL WEIGHT LAID IN RUNNING BOND.
4. SHORE LINTEL UNTIL CONCRETE CURES (7 DAY MIN)

LINTEL SCHEDULE

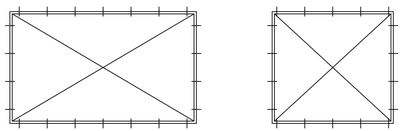
PLAN MARK	MAXIMUM OPENING WIDTH FT	CASTCRETE LINTEL DETAILS	ACTUAL LOADS PLF	ALLOWABLE LOADS PLF
L1	4'–0"	8F8, 1T	1100 –636	1969 G –1407 U
L2	8'–0"	8F16, 1T, 1B	1100 –636	1625 G –1133 U
L3	12'–0"	8F24, 1T, 1B	1100 –636	1838 G –962 U

1838 G: 1836 PLF VERTICAL GRAVITY LOAD
–962 U: 962 PLF UPLIFT LOAD

10 CONCRETE MASONRY LINTEL DETAILS
NTS



5 TYPICAL RC COLUMN DETAILS
NTS

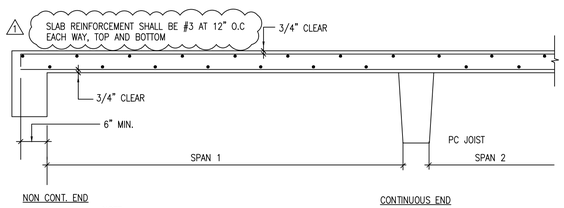


(WINDOW & DOOR OPENINGS 7'–0" WIDE AND LARGER)
1" X P.T. BUCK W/ 1/4"ø X 1 1/2" CONC. EMBEDMENT TAPCON W/ 1"ø WASHER AT 8"o.c., START 3" FROM CORNERS.

(WINDOW & DOOR OPENINGS 6'–6" WIDE AND SMALLER)
1" X P.T. BUCK W/ 1/4"ø X 1 1/2" CONC. EMBEDMENT TAPCON W/ 1"ø WASHER AT 12"o.c., START 3" FROM CORNERS.

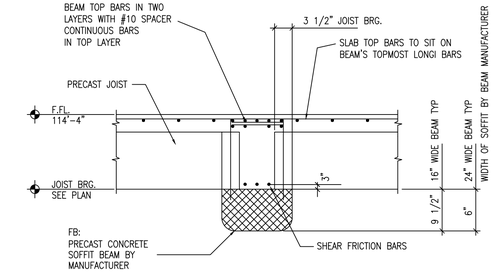
BUCKS TO BE FASTENED HORIZONTALLY AND VERTICALLY TO CONCRETE BEAMS AND COLUMNS OR CONCRETE FILLED MASONRY.
G.C. TO COORDINATE OPENING DIMENSIONS AND BUCK FASTENING DETAIL WITH PRODUCT APPROVALS.

6 MINIMUM WINDOW/ DOOR BUCK FASTENERS TO CMU OR RC MEMBERS
NTS

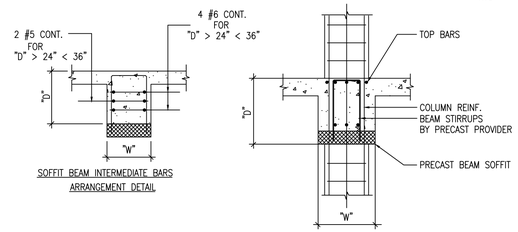


NOTE:
SEE PLANS FOR SLAB DEPTH AND SLAB SUPPORT SPACING.

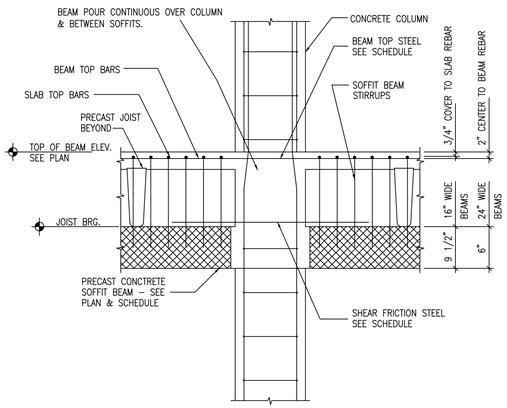
7 FLOOR SLAB REINFORCEMENT LAYOUT
NTS



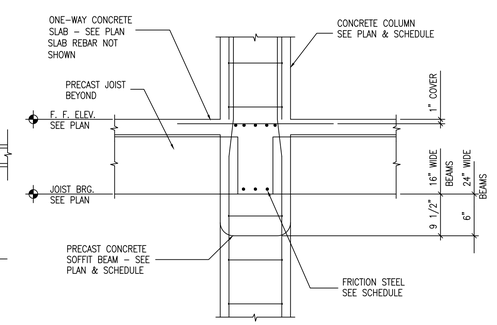
1 TYPICAL SOFFIT BEAM SECTION
NTS



2 SOFFIT BEAM DETAILS
NTS



3 SOFFIT BEAM TO COLUMN DETAIL
NTS



4 SOFFIT BEAM TO COLUMN DETAIL
NTS

Song + Associates
Architecture● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

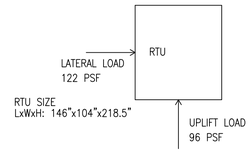
1 RFI #2	10/6/22

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR SECTIONS AND DETAILS

Sheet # :
S22



A ULTIMATE WIND LOADS ON ROOF TOP UNITS

DESIGN LOADING PER FLORIDA BUILDING CODE 2020

WIND LOAD PER ASCE 7 16:

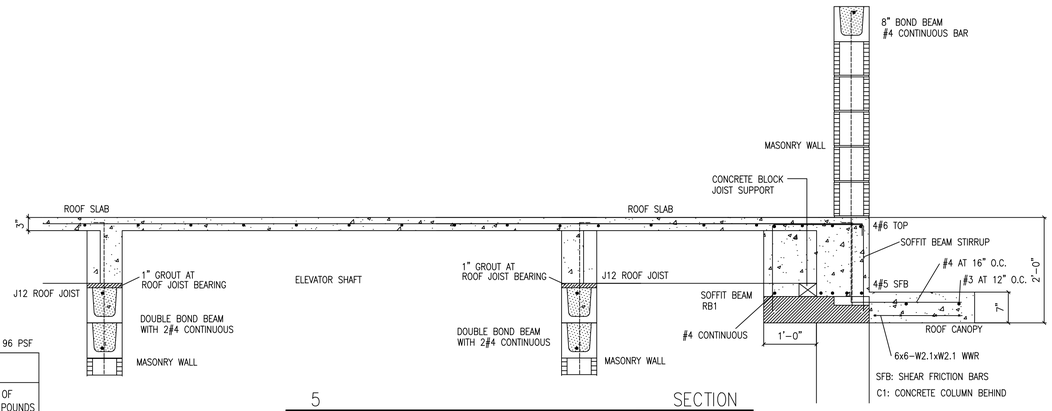
BASIC ULTIMATE WIND SPEED = 170 MPH (132 MPH ASD)
RISK CATEGORY II WIND EXPOSURE CATEGORY "C"
INTERNAL PRESSURE COEFFICIENT = 0
MEAN UNIT HEIGHT = 27 FT
WIND DIRECTIONALITY FACTOR Kd = 0.85 Kz = 0.96
BASIC ULTIMATE WIND PRESSURE = 64 PSF

FOR ROOF TOP UNITS,
LATERAL FORCE COEFFICIENT = 1.9 WL = 122 PSF UPLIFT COEFFICIENT = 1.5 WL = 96 PSF

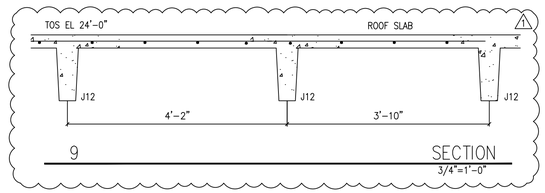
TABLE 1: ULTIMATE WIND LOADS ON UNITS PER ASCE 7 16

UNIT	LATERAL LOADS		UPLIFT ON UNIT, POUNDS	WEIGHT OF UNIT, POUNDS	WEIGHT OF STAND, POUNDS
	ON LENGTH, POUNDS	ON WIDTH, POUNDS			
RTU-1	2068	1773	1371	380	50*
RTU-2	2068	1773	1371	380	50*
RTU-3	2068	1773	1371	380	50*
RTU-4	2068	1773	1371	380	50*
RTU-5	2490	1899	1769	460	50*
RTU-6	2490	1899	1769	460	50*
RTU-7	2490	1899	1769	460	50*

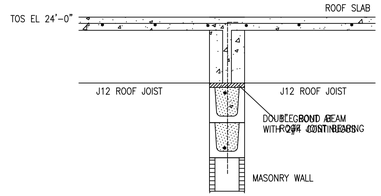
* ASSUMED. FIELD VERIFY. ASD WIND PRESSURE = 0.6x ULTIMATE WIND PRESSURE



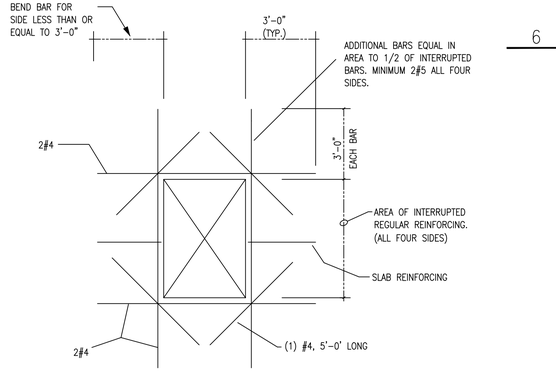
5 SECTION 3/4"=1'-0"



9 SECTION 3/4"=1'-0"



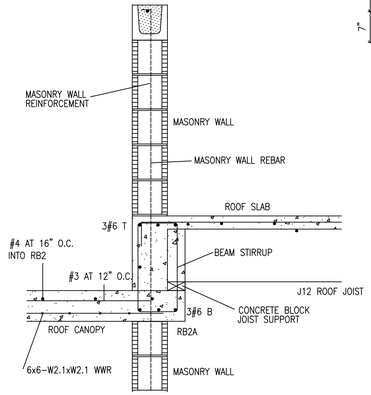
6 SECTION 3/4"=1'-0"



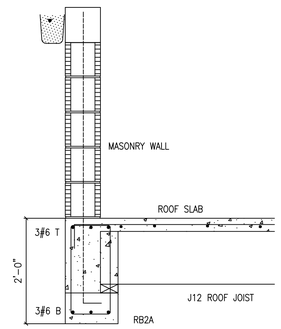
REINFORCING AT OPENING

1. OMIT ADDED BARS AT OPENINGS OF 10" OR LESS AND RUN NORMAL REINFORCING BY SIDE OF OPENING.
2. OPENINGS SHALL BE SHOWN ON THE REINFORCING STEEL SHOP DRAWINGS.

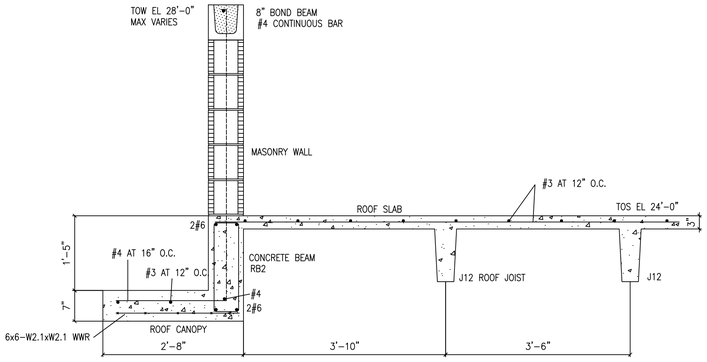
10 SLAB OPENING DETAIL NTS



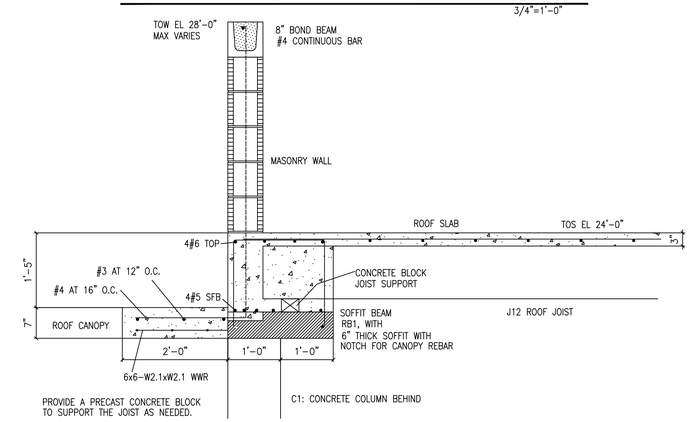
7 SECTION 3/4"=1'-0"



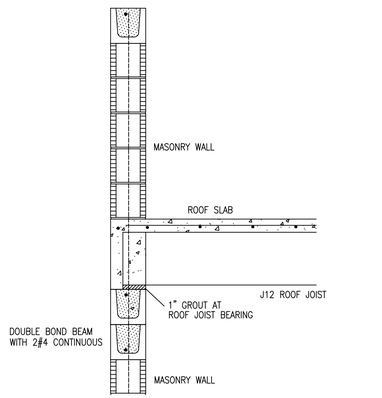
8 SECTION 3/4"=1'-0"



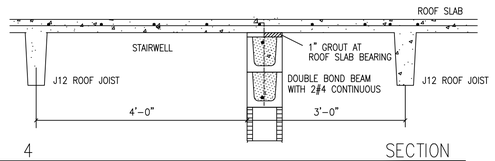
1 SECTION 3/4"=1'-0"



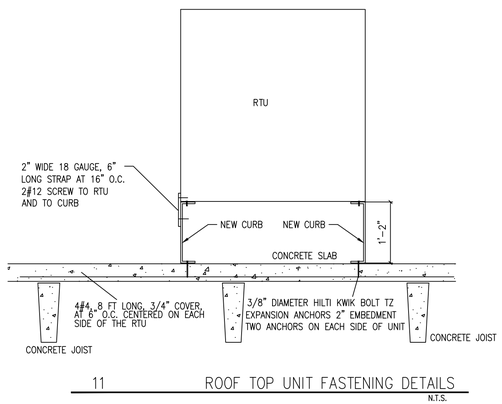
2 SECTION 3/4"=1'-0"



3 SECTION 3/4"=1'-0"



4 SECTION 3/4"=1'-0"



11 ROOF TOP UNIT FASTENING DETAILS N.T.S.

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
ROOF SECTIONS AND DETAILS

Sheet # :

S31

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 2
TO
INVITATION TO BID NO. CRA 2022-01
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

OCTOBER 13, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to clarify the BID BOND document. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

CLARIFICATION

The BID BOND has been revised and attached to this Addendum #2. Bidders are required to use this revised BID BOND when submitting a Bid.

Please disregard other BID BOND documents previously issued.

ADDENDUM NO.2 ATTAC MENTS

1. Bid Bond

BID BOND

STATE OF FLORIDA)
) SS
COUNTY OF _____)

KNOW ALL MY BY THESE PRESENTS that _____ as Principal, and _____ as surety, are held and firmly bound unto the Delray Beach Community Redevelopment Agency, Florida, hereinafter called the CRA in the penal sum of _____ dollars ( ) lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas the Principal has submitted the accompanying bid, dated _____, for project titled:

95 SW 5th Avenue Corridor Improvements
Design Build Construction Services
ITB CRA No. 2022-01

NOW, THEREFORE,

(a) It is a condition precedent to the submission of said bid that a certified check, cashier's check or bid bond in the amount of five percent (5%) of the base bid be submitted with said bid as a guarantee that Bidder would, if awarded the contract, enter into a written contract with the CRA for the completion of the Work specified in the Contract Documents for the amount indicated in the Bid.

(b) If the Principal shall not withdraw said bond within (90) days after date of the same, and shall within (30) days after the prescribed forms are presented to him for signature, enter into a written contract with the CRA in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligation shall be void and of no effect, otherwise the sum herein stated shall be due and payable to the CRA and the surety herein agrees to pay said sum immediately upon demand of the CRA in good and lawful money of the United States of America as liquidated damages for failure thereof of said principal.

IN WITNESS WHEREOF, the above-bounded parties executed this instrument under their several seals, this _____ day of _____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

I _____ (person), on behalf of
(surety)
_____ (Surety Company) have read

and examined the BID BOND attached to Bid No._____.

_____ Date: _____
Signature

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses required). (If Corporation, Secretary Only will attest and affix seal)

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

PRINCIPAL

_____
(firm name)

By: _____
(Signature of Authorized Officer)

(affix Seal)

Print Name: _____

Title: _____

Business Address:
_____
_____
_____

WITNESSES:

_____

Print Name: _____

_____

Print Name: _____

SURETY

_____
(firm name)

By: _____
(Signature, Attorney-in-Fact)

(affix Seal)

Print Name: _____

Business Address
_____
_____
_____

Name of Local Insurance Agency

_____

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 3
TO
INVITATION TO BID NO. CRA 2022-01-R
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

NOVEMBER 2, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

NOTE

Wherever applicable throughout the ITB document, Bidders are hereby advised that the ITB NO.CRA 2022-01 is now **ITB NO. CRA 2022-01-R**. Bid Submission Due Date and Time remains **W**ednesday **, N**ovember **9, 2022,** at **3 00PM EST**. The location of delivery for the Bids remains the CRA Office located at 20 N Swinton Avenue, Delray Beach, FL 33444.

ADDITIONAL INFORMATION

The Geotechnical Report for the Project Site is attached to this Addendum No. 3.

QUESTIONS

1. **On sheet E101B, the two fixtures are marked "relocated" –** should these be included in the **B**id **P**rice

   These two fixtures are under the new building footprint. As such, their relocation should be included in the scope of work for the Project and Bid Price.

2. **On sheet E101A both "D" fixtures are marked as "D" [illegible] E101 [illegible] is "DE", please clarif[illegible].**

   The fixture marked "DE", as indicated in sheet E101 at the exit door, is correct. Please use this reference for sheet E101A as well.

---

3. **O[illegible] E101 [illegible] [illegible] XC1 [illegible], [illegible] is the "X" fixture on the schedule or different [illegible]**

   X and X1 shall be the same fixture. Any reference to XC1 shall be replaced by X and/or X1. There is no XC1 fixture included on the schedule.

---

4. **On sheet E101 there is a "PGE" by the storage room [illegible] E101A P[illegible], [illegible].**

   On sheet E101, the fixture is "PGE" by the storage room.
   On sheet E101A Photometrics, the same fixture is "PG" by the storage room.

---

5. **P[illegible] S[illegible] 2 S[illegible] T[illegible] [illegible] C[illegible], [illegible] N[illegible]. 15 BID BOND/GUARRANTY…." Additionally, B[illegible] [illegible] B[illegible] [illegible]"...I[illegible] [illegible]**

   Yes, such a letter will suffice this requirement.

---

6. **P[illegible] [illegible] [illegible] [illegible], [illegible], [illegible]. I[illegible]**

   Refer to duct construction schedule on sheet M-601 and specification sections No. 230700 and 23100 for the appropriate materials.

---

7. **R[illegible] M[illegible] B[illegible] M[illegible]. C[illegible] TOP**

   Please provide specified material only. A single-ply TPO membrane system is not acceptable for this Project.

8. **Page 33 of the ITB states, "Bidders must provide all applicable Certificate of Competency(ies) issued to the subcontractor(s)." Please clarify if all Subcontractor Certificates of Competency are required to be submitted with the Bid Submission, or if they can be submitted after the Bid Opening, prior to the award of contract.**

   Please refer to the below as stated in the ITB:

   Section 2: Special Terms and Conditions, Subsection 14: Certifications "…If other professions or trades are required in conjunction with this Bid Solicitation and such work and/or services will be performed or provided by a subcontractor(s), an applicable Certificate of Competency issued to the subcontractor(s) shall be submitted with the Bidder's Bid; provided, however, that the CRA may at its option and in its best interest allow the Bidder to supply the subcontractor(s) certificate to the CRA during the evaluation period prior to any award of contract."

   Section 2: Special Terms and Conditions, Subsection 28: Subcontractors of Work Shall be Identified "As part of its Bid, the Bidder must identify any and all subcontractors that will be used in the performance of the proposed scope of work, their qualifications (including any licenses, certifications, etc.), capabilities, experience, and the portion of the work to be done by the subcontractor. The competency of the subcontractor(s) with respect to experience, skill, responsibility and business standing shall be considered by the CRA when making the award in the best interest of the CRA. If the Bidder fails to identify any and all subcontractors in the Bid, the Bidder may be allowed to submit this documentation during the Bid evaluation period, prior to the award of any Contract, at the sole and absolute discretion of the CRA."

   As stated in the ITB, if Subcontractor(s) Certificates of Competency(ies) are not included with the submitted Bid, the CRA may at its option, and at its sole and absolute discretion, allow the Bidder to supply such information during the Bid evaluation period, prior to the award of any Contract.

ADDENDUM NO.3 ATTACHMENTS

1. Geotechnical Report

REPORT OF
GEOTECHNICAL EXPLORATION

PROPOSED DELRAY BEACH CRA OFFICE BUILDING
95 SW 5TH AVENUE
DELRAY BEACH, FLORIDA

FOR

SONG & ASSOCIATES, INC.
1545 CENTREPARK DRIVE NORTH
WEST PALM BEACH, FLORIDA 33401

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
1310 NEPTUNE DRIVE
BOYNTON BEACH, FLORIDA 33426

ORDER NO. 18311.3

OCTOBER 2022

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

Geotechnical & Construction Materials
Engineering, Testing, & Inspection
Environmental Services

Offices throughout the state of Florida

www.nuttingengineers.com info@nuttingengineers.com

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

Geotechnical & Construction Materials
Engineering, Testing, & Inspection
Environmental Services

Offices throughout the state of Florida

www.nuttingengineers.com info@nuttingengineers.com

October 31, 2022

Mr. Henrique Certad
Song & Associates, Inc.
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Phone: 561-655-2423 ext. 121 Email: hcertad@songandassociates.com

Subject: Report of Geotechnical Exploration
Proposed Delray Beach CRA Office Building
95 SW 5th Avenue
Delray Beach, Florida

Dear Mr. Certad:

Nutting Engineers of Florida, Inc. (NE), has performed a Geotechnical Exploration for the proposed office building at the above referenced site in Delray Beach, Florida. This exploration was performed in accordance with the written authorization to proceed provided by Song & Associates, Inc. dated October 19, 2022. This evaluation was performed to develop information regarding subsurface soil conditions at specific test locations which along with proposed construction information provided was used to develop opinions regarding earthwork procedures and foundations for support of the proposed construction. This report presents our findings and recommendations based upon the information examined at the time of this evaluation.

PROJECT INFORMATION

We understand that plans include the demolition of any existing structures or features at the site for the development of a new one to a two-story office building. The building will have a total area of approximately 7,000 square feet and consist of concrete block construction. We were provided with a boundary survey detailing the existing site conditions. Plans for the new construction were not provided at the time of this report; therefore, if any information is incorrect our office must be notified in writing in order to review our recommendations provided herein. The building is proposed to be supported upon a shallow foundation system similar to nearby structures. Along with the building associated asphalt paved parking lots, roadways, sidewalks, landscaped islands, dumpster pad, and other typical commercial development ancillary features will be constructed.

Based on current site elevations, we estimate that one to two feet of fill may be required to bring the site up to construction grade; however, the final building pad elevation shall be determined by a professional architect, civil engineer, or other qualified party.

1310 Neptune Drive • Boynton Beach, Florida 33426 • (561) 736-4900 • Fax (561) 737-9975
Broward (954) 941-8700 • Port St. Lucie (772) 408-1050 • Miami Dade (305) 624-0060

NE should be notified in writing by the client of any changes in the proposed construction along with a request to amend our foundation analysis and/or recommendations within this report as appropriate.

GENERAL SUBSURFACE CONDITIONS

Soil Survey Maps

As part of the geotechnical exploration, we have reviewed available Soil Conservation Service (SCS) survey maps for Palm Beach County. These SCS maps provide qualitative information about potential general shallow soil conditions in the project vicinity. This information was derived from approximately 6 ft. deep manual auger borings, aerial photo, and surface feature interpretation at some point in the past (mid 1980's to early 1970's). The SCS data may or may not reflect actual current site conditions. The United States Soil Conservation Soils Map for Palm Beach County indicates St. Lucie sand in the area of the site. This nearly level to sloping, excessively drained, deep, sandy soil is on long narrow, dune-like coastal ridges and on isolated knolls. A representative pedon contains a surface layer of gray sand about 5 inches thick. Below this is white sand that extends to a depth of 80 inches or more. We note that the maximum depth of the survey is six feet.

Subsurface Exploration

NUTTING ENGINEERS OF FLORIDA, INC. performed three Standard Penetration Test (SPT) borings (ASTM D-1586) to depths of twenty-five feet below land surface. The locations of the test borings are indicated on the boring location plan presented in the Appendix of this report. The boring locations were identified in the field using approximate methods; namely, a measuring wheel and available surface controls. As such the soil boring locations should be considered to be approximate. We note that due to the potential for underground utilities at the test boring locations, the upper four feet of the soil profile at the test boring locations were manually cleared. Because of this, the relative density of the upper four feet was not obtained.

Test Boring Results

In general, the soil boring locations recorded loose to medium dense light gray to light brown sand in the upper seventeen feet, underlain by soft porous gray limestone and sand to a depth of twenty-five feet, the maximum depth explored. Please see the enclosed soil classification sheet in the Appendix of this report for additional important information regarding these descriptions, the field evaluation and other related information.

Note: Substantially different subsurface conditions may exist at other areas of the site. Buried debris may or may not be identified or adequately delineated by soil borings. Test pit excavation can provide more insight into such conditions and rock lithology if present. Such conditions may be revealed during site development activities (e.g., proof rolling, utility & foundation excavation activities) or other related activities. Should additional assurance be desired by the client, further subsurface investigation could be performed.

Groundwater Information

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at an approximate depth thirteen and a half to fourteen feet below the existing ground surface at the time of drilling.

The immediate depth to groundwater measurements presented in this report will not provide a reliable indication of stabilized or more long-term depth to groundwater at this site. Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations.

ANALYSIS AND RECOMMENDATIONS

The borings performed for this project suggest that loose to very loose sands exist in the upper twenty-five feet of the soil profile. In order to prepare the site for the proposed construction, we recommend that an undercut and compaction program be implemented. Once the site has been prepared in accordance with our site preparation recommendations presented in this report, the proposed office building may be supported on a shallow foundation system using an allowable soil bearing pressure of 2,500 pounds per square foot. Once plans are finalized for the proposed construction, a copy should be provided to Nutting Engineers for review to determine whether additional details or changes to our recommendations are warranted. All work should be completed in accordance with applicable building codes, other regulations as appropriate, and good standard local practice.

For one-story construction, we recommend a minimum width of 16 inches for continuous footings and 24 inches for individual footings, even though the soil bearing pressure may not be fully developed in all cases. For two-story construction, we recommend a minimum width of 24 inches for continuous footings and 30 inches for individual footings, even though the soil bearing pressure may not be fully developed in all cases. We recommend that the bottom of footings be at least 12 inches below the lowest adjacent finished grade.

It is our opinion that the floor slab system may be constructed as a slab on grade. We recommend that a vapor barrier be placed between the soil and concrete. We also recommend that the reinforcing steel mesh be placed at the approximate center of the slab for tensile support.

Settlement Analysis

We performed a settlement evaluation based upon a hypothetical improved soil profile following completion of the undercut and compaction operations using a moderately sized vibratory compactor for the construction. This method should improve the soils to provide an allowable bearing capacity of 2,500 pounds per square foot.

It was estimated that upon proper completion, long-term total settlements should be on the order of less than approximately one inch. Differential settlements should be approximately one-half of the total settlement. Most of this settlement should occur upon the application of the dead load during construction.

We note that in order to maintain the calculated settlement throughout the life of the structure it would be necessary to grade the site such that stormwater is directed away from the foundations. Any ponding nearby/adjacent to walls and foundations should be avoided.

Site Preparation

Any debris from the clearing operations, and any unsuitable soils as determined by the Geotechnical Engineer will need to be completely removed within the construction area and to a lateral distance of at least 5 feet beyond the footprint limits. A Nutting Engineer's representative should be present to observe that the stripping operations are performed as we have discussed herein.

Upon approval by the geotechnical engineer, the building area should then be **undercut to a depth of two feet (24-inches) below existing site elevation**. The undercut surface should then be thoroughly soaked with water and compacted with at least 20 overlapping passes of a vibratory compactor operated no faster than at a slow walking pace. The coverages should be equally divided into two perpendicular directions. **The compaction operations must be observed by a representative of Nutting Engineers.**

In addition, the surface should also be compacted until a density equivalent to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557) is achieved to a depth of at least 12 inches below the compacted surface.

The stockpiled backfill and any structural fill needed to bring the site to construction grade may then be placed in lifts not exceeding twelve inches in loose thickness. Each lift should be thoroughly compacted until densities equivalent to at least 98 percent of the modified Proctor maximum dry density are uniformly obtained. Fill should consist of granular soil, with less than 10% passing the No. 200 sieve, free of rubble, organics (5% or less) clay, debris, and other unsuitable material. The fill should have ASTM designation (D-2487) of GP, GW, SP, or SW, with a maximum particle size of no more than 3 inches or as otherwise approved by Nutting Engineers.

Following site and building pad construction as discussed above, the foundation area should be excavated, and the footings formed.

The bottom of foundation excavations should be compacted after excavation to develop a minimum density requirement of 98 percent of the maximum modified Proctor dry density, for a minimum depth of one (1) foot below the bottom of the footing depth, as determined by field density compaction tests. The floor slab area should also be compacted in the same manner.

Pavements

The results of the test borings suggest that conventional pavement construction practices may be implemented for the new parking lots and driveway areas. Based on the borings performed, the soils in the upper three feet consist of sand. Because of this it should be anticipated that new material will need to be imported to the site in order to prepare the base and sub-base course.

For asphalt pavement, the areas should be compacted to a minimum of 98 percent of the modified Proctor maximum dry density to a depth of at least 12 inches below the subgrade level. We recommend that stabilized subgrade having a minimum Limerock Bearing Ratio (LBR) of 40 be placed to a depth of approximately one foot below the base course. The base course will range from approximately 6 to 8 inches and should have a minimum LBR of 100.

Where concrete pavement is used, a minimum concrete pavement thickness of 6 inches is recommended for the standard and heavy-duty pavement design. The minimum thickness is based upon concrete with a compressive strength of 3,500 psi, and a modulus of rupture of 550 psi. The pavement section should bear on properly compacted subgrade similar to asphalt pavement sections discussed in the paragraph above.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

Mr. Henrique Certad
Song & Associates, Inc.
1545 Centrepark Drive North
West Palm Beach, Florida 33401

The contents of this report are for the exclusive use of the client, the client's design & construction team and governmental authorities for this specific project exclusively. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of Nutting Engineers of Florida, Inc. This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination, and other environmental considerations are beyond our scope of service for this project. As such, this report should not be used or relied upon for evaluation of environmental issues.

Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable in-place soils be collected and tested to determine their compaction and classification characteristics. The maximum dry density, optimum moisture content, gradation and plasticity characteristics should be determined. These tests are needed for compaction quality control of the structural fill and existing soils, and to determine if the fill material is acceptable.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated, and appropriate action taken.

The vibratory compaction equipment may cause vibrations that could be felt by persons within nearby buildings and could potentially induce structural settlements. Additionally, preexisting settlements may exist within these structures that could be construed to have been caused or worsened by the proposed vibratory compaction after the fact. Pre- and post-conditions surveys of these structures along with the vibration monitoring during vibratory compaction could be performed to better evaluate this concern. The contractor should exercise due care during the performance of the vibratory compaction work with due consideration of potential impacts on existing structures. If potential vibrations and impacts are not considered tolerable, then alternate foundation modification techniques should be considered.

Nutting Engineers of Florida, Inc. (NE), recommends that we be contracted to provide input to the design team and owner during the foundation and earthwork design process and that we review final foundation drawings and specifications to verify that our report recommendations and design intent have been properly implemented. NE shall also perform testing and inspections during the earthwork and foundation construction as recommended in this report. If NE is not engaged to perform these services as detailed herein, the Client agrees that NE shall bear no liability for the interpretation, implementation of our report, its recommendations and/or inspection and testing services as described in this report if implemented by others.

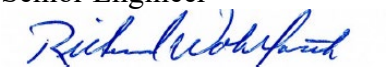
Excavations of five feet or more in depth should be sloped or shored in accordance with OSHA and State of Florida requirements.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to be of service on this project. If we can be of any further assistance, or if you need additional information, please contact us at your convenience.

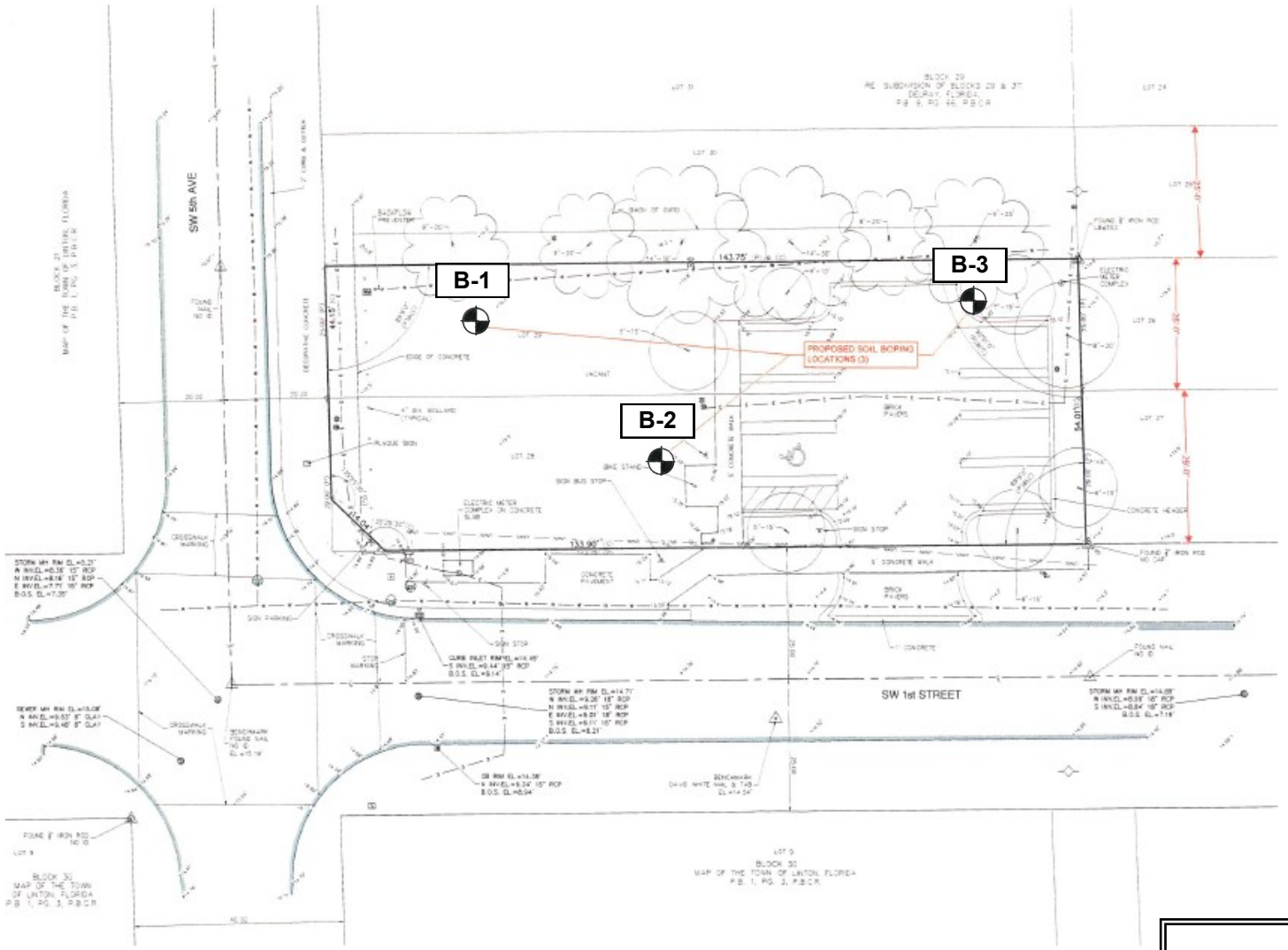
Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

Christopher E. Gworek, P.E. #69947
Senior Engineer



Richard C. Wohlfarth, P.E.
Director of Engineering

Appendix: Boring Location Plan
Test Boring Results
Limitations of Liability
Soil Classification Criteria



NUTTING ENGINEERS OF FLORIDA, INC. ESTABLISHED 1967

Song + Associates, Inc.
Delray CRA Office Building
95 SW 5th Avenue
Delray Beach, Florida
PROJECT NO. 18311.3

APPROXIMATE TEST LOCATION PLAN

GEOTECHNICAL EXPLORATION
— ***Not to Scale*** —

FIG. 1

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: (561) 736-4900
Fax: (561) 737-9975

BORING NUMBER B-1

PROJECT NUMBER 18311.3

CLIENT Song + Associates, Inc.

PROJECT NAME Delray CRA Office Building

PROJECT LOCATION 95 SW 5th Avenue, Delray Beach, Florida

DATE STARTED 10/26/22 COMPLETED 10/26/22

SURFACE ELEVATION REFERENCE Approx. @ Road Crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Simmons CHECKED BY C. Gworek

▽ AT TIME OF DRILLING 14.0 ft

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		Gray to brown fine SAND, some limestone fragments	AU 1			
		Gray fine SAND	AU 2			
		Lt. tan fine SAND				
5			SS 3	3-3-3-3	6	▲
		Brown fine SAND	SS 4	2-2-2-2	4	▲
			SS 5	2-2-2-2	4	▲
10		Lt. brown fine SAND				
		▽	SS 6	1-2-1-2	3	▲
15						
			SS 7	1-1-2-1	3	▲
20						
		Lt. gray LIMESTONE and SAND	SS 8	1/12"-1/12"	1	▲
25		Bottom of hole at 25.0 feet.				

TEST NUTTING BOREHOLE 1-18311.3 SONG + ASSOCIATES - DELRAY CRA OFFICE BUILDING 95 SW 5TH AVENUE DELRAY BEACH.GPJ GINT US.GDT 10/28/22

Disclaimer Nutting Engineers of Florida, Inc. accepts no liability for the consequences of the independent interpretation of drilling logs by others.

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: (561) 736-4900
Fax: (561) 737-9975

BORING NUMBER B-2

PROJECT NUMBER 18311.3

CLIENT Song + Associates, Inc.

PROJECT NAME Delray CRA Office Building

PROJECT LOCATION 95 SW 5th Avenue, Delray Beach, Florida

DATE STARTED 10/26/22 COMPLETED 10/26/22

SURFACE ELEVATION REFERENCE Approx. @ Road Crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Simmons CHECKED BY C. Gworek

▽ AT TIME OF DRILLING 13.5 ft

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		Gray to brown fine SAND, little limestone fragments	AU 1			
		Lt. gray fine SAND	AU 2			
5		Gray to brown fine SAND	SS 3	3-5-7-5	12	
		Brown fine SAND	SS 4	4-5-5-4	10	
		Lt. brown fine SAND	SS 5	3-3-3-4	6	
10						
		▽	SS 6	1/18"-1	0	
15						
		Lt. gray fine SAND, some limestone	SS 7	1/12"-1/12"	1	
20						
			SS 8	1/12"-1/12"	1	
25		Bottom of hole at 25.0 feet.				

TEST NUTTING BOREHOLE 1-18311.3 SONG + ASSOCIATES - DELRAY CRA OFFICE BUILDING 95 SW 5TH AVENUE DELRAY BEACH.GPJ GINT US.GDT 10/28/22

Disclaimer Nutting Engineers of Florida, Inc. accepts no liability for the consequences of the independent interpretation of drilling logs by others.

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: (561) 736-4900
Fax: (561) 737-9975

BORING NUMBER B-3

PROJECT NUMBER 18311.3

CLIENT Song + Associates, Inc.

PROJECT NAME Delray CRA Office Building

PROJECT LOCATION 95 SW 5th Avenue, Delray Beach, Florida

DATE STARTED 10/26/22 COMPLETED 10/26/22

SURFACE ELEVATION REFERENCE Approx. @ Road Crown

DRILLING METHOD Hand Auger

GROUND WATER LEVELS:

LOGGED BY T. Simmons CHECKED BY C. Gworek

AT TIME OF DRILLING >8'

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		Dk. gray fine SAND	AU 1			
		Lt. gray fine SAND	AU 2			
5		Brown fine SAND	AU 3			
		Tan fine SAND	AU 4			
		Bottom of hole at 8.0 feet.				

TEST NUTTING BOREHOLE 1-18311.3 SONG + ASSOCIATES - DELRAY CRA OFFICE BUILDING 95 SW 5TH AVENUE DELRAY BEACH.GPJ GINT US.GDT 10/28/22

Disclaimer Nutting Engineers of Florida, Inc. accepts no liability for the consequences of the independent interpretation of drilling logs by others.

LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made***. While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. ***The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.*** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Stiff
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25≤ N ≤ 100	Medium hard to hard	
5≤ N ≤ 25	Soft to medium hard	

PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names	Laboratory classification criteria
Coarse-grained soils (More than half of material is *larger* than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gavels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than five percent……GW, GP, SW, SP More than 12 percent……GM, GC, SM, SC 5 to 12 percent……*Borderline* cases requiring dual systems**
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	
		Gravels with fines (Appreciable amount of fines)	GW* d	Silty gravels, gravel-sand-silt mixtures	
			u		
			GC	Clayey gravels, gravel-sand-clay mixtures	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	
			SP	Poorly graded sands, gravelly sands, little or no fines	
		Sands with fines (Appreciable amount of fines)	SM* d	Silty sands, sand-silt mixtures	
			u		
			SC	Clayey sands, sand-clay mixtures	
Fine-grained soils (More than half of material is *smaller* than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy, clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH	Inorganic clays or high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
	Highly organic soils		PT	Peat and other highly organic soils	

$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3

Not meeting all gradation requirements for GW

Atterberg limits below "A" line or P.I. less than 4

Atterberg limits above "A" line with P.I. greater than 7

Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.

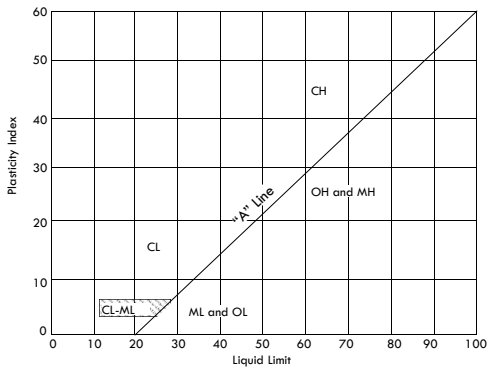
$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3

Not meeting all gradation requirements for SW

Atterberg limits below "A" line or P.I. less than 4

Atterberg limits above "A" line with P.I. more than 7

Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual system.



Plasticity Chart

Nutting Engineers of Florida Inc. | Established 1967
Your Project is Our Commitment

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 4
TO
INVITATION TO BID NO. CRA 2022-01-R
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

NOVEMBER 7, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

MODIFICATION

Wherever applicable throughout the ITB document, Bidders are hereby advised that the Bid Submission Due Date and Time has been extended due to impending weather conditions to **W□□□□□□□□, N□□□□ □□□16, 2022, □□3 00PM EST**. The location of delivery for the Bids remains the CRA Office located at 20 N Swinton Avenue, Delray Beach, FL 33444.

NOTE

Wherever applicable throughout the ITB document, Bidders are hereby advised that the ITB NO. CRA 2022-01 is now **ITB NO. CRA 2022-01-R**

QUESTIONS

1. Plan sheet **LNP.1** tree disposition chart indicates trees **1, 2** and **3** are to be removed **.** Plan sheet **AD-100 S**ite **D**emo indicates all **13** trees are to be removed **.** Please clarify **.**

   Please follow Tree Disposition Chart on sheet LNP.1

---

2. **C**an we use **TPO** system as an alternative for the roofing **I**□ there any approved equal manufacturer for the roofing such as **GAF, C**ertainteed or **F**irestone

   A single-ply TPO membrane system is not acceptable for this Project.

   Please provide specified material only. There is no other approved material.

PROJECT MANUAL
FOR
CITY OF DELRAY BEACH
S+A Project No. 18063

95TH SW 5TH AVE, DELRAY BEACH, FL 33444

DELRAY CRA DEVELOPMENT

100% Construction Document Submission
□□□□□□ 5□□, 2022

PREPARED BY:

SONG + ASSOCIATES, INC.
ARCHITECTURE • PLANNING • INTERIOR DESIGN
1545 CENTREPARK DRIVE NORTH
WEST PALM BEACH, FLORIDA, 33401
(561) 655-2423 / FAX (561) 655-1482

宋 Song + Associates, Inc.
Architecture • Planning • Interior Design

00 01 10
TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 10 00	SUMMARY	**1**
01 20 00	PRICE AND PAYMENT PROCEDURES	**3**
01 25 00	SUBSTITUTION PROCEDURES	**3**
01 30 00	ADMINISTRATIVE REQUIREMENTS	**9**
01 32 16	CONSTRUCTION PROGRESS SCHEDULE	**2**
01 40 00	QUALITY REQUIREMENTS	**6**
01 50 00	TEMPORARY FACILITIES AND CONTROLS	**3**
01 60 00	PRODUCT REQUIREMENTS	**3**
01 61 16	VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS	**2**
01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS	**6**
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	**3**
01 78 00	CLOSEOUT SUBMITTALS	**4**

DIVISION 02 - EXISTING CONDITIONS

02 41 00	DEMOLITION	**3**
02 65 00	UNDERGROUND STORAGE TANK REMOVAL	**6**

DIVISION 03 - CONCRETE

03 11 00	CONCRETE FORMWORK
03 20 00	CONCRETE REINFORCEMENT
03 30 00	CAST-IN-PLACE CONCRETE
03 35 00	CONCRETE FLOOR FINISHING
03 36 00	POLISHED CONCRETE FLOOR FINISHING
03 41 00	STRUCTURAL PRE-CAST CONCRETE
03 52 16	LIGHTWEIGHT INSULATING CONCRETE

DIVISION 04 - MASONRY

04 05 13	MASONRY MORTAR AND GROUT
04 20 00	MASONRY UNITS
04 20 10	REINFORCED MASONRY UNITS

DIVISION 04 - METAL

05 50 00	METAL FABRICATIONS
05 51 00	METAL STAIRS
05 52 00	METAL RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY	**5**

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 05 53	FIRE AND SMOKE ASSEMBLY IDENTIFICATION	**1**
07 13 26	UNDER-SLAB VAPOR BARRIER	**2**
07 21 00	THERMAL INSULATION	**5**
07 52 00	MODIFIED BITUMINOUS MEMBRANE ROOFING	**16**
07 71 00	ROOF SPECIALTIES	**3**
07 72 00	ROOF ACCESSORIES	**3**
07 84 00	FIRESTOPPING	**13**
07 92 00	JOINT SEALANTS	**9**
07 95 13	EXPANSION JOINT COVER ASSEMBLIES	**3**

DIVISION 08 - OPENINGS

08 11 13	HOLLOW METAL DOORS AND FRAMES	**5**
08 17 00	INTEGRATED DOOR OPENING ASSEMBLIES	**4**
08 43 13	ALUMINUM-FRAMED STOREFRONTS	**6**
08 71 00	FINISH HARDWARE	**5**
08 71 01	HARDWARE GROUPS	**3**
08 80 00	GLAZING	**6**

DIVISION 09 - FINISHES

09 05 61	COMMON WORK RESULTS FOR FLOORING PREPARATION	**5**
09 21 16	GYPSUM BOARD ASSEMBLIES	**6**
09 30 00	TILING	**6**
09 50 00	INTEGRATED CEILING ASSEMBLIES	**7**
09 51 00	ACOUSTICAL CEILINGS	**4**
09 65 00	RESILIENT FLOORING	**4**
09 90 00	PAINTING AND COATING - COMMERCIAL FACILITY GUIDE SPECIFICATION	**3**
09 91 13	EXTERIOR PAINTING	**1**
09 91 23	INTERIOR PAINTING	**1**
09 97 23	CONCRETE AND MASONRY COATINGS	**3**

DIVISION 10 - SPECIALTIES

10 44 00	FIRE PROTECTION SPECIALTIES	**2**

DIVISION 22 – PLUMBING

22 01 00 GENERAL PLUMBING PROVISIONS
22 05 19 METERS AND GAGES FOR PLUMBING PIPING
22 05 23.12 BALL VALVES FOR PLUMBING PIPING
22 05 23.14 CHECK VALVES FOR PLUMBING PIPING
22 05 29 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 19 PLUMBING PIPING INSULATION
22 11 13 FACILITY WATER DISTRIBUTION PIPING
22 11 16 DOMESTIC WATER PIPING
22 11 19 DOMESTIC WATER PIPING SPECIALTIES
22 13 16 SANITARY WASTE AND VENT PIPING
22 13 19 SANITARY WASTE PIPING SPECIALTIES
22 13 19.13 SANITARY DRAINS
22 14 13 FACILITY STORM DRAINAGE PIPING
22 14 23 STORM DRAINAGE PIPING SPECIALTIES
22 14 29 SUMP PUMPS
22 33 00 ELECTRIC, DOMESTIC-WATER HEATERS
22 42 13.13 COMMERCIAL WATER CLOSETS
22 42 16.13 COMMERCIAL LAVATORIES

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

23 01 00 GENERAL MECHANICAL PROVISIONS
23 05 00 BASIC MECHANICAL MATERIALS AND METHODS
23 05 13 ELECTRIC MOTORS, PREMIUM EFFICIENCY TYPE
23 05 15 INSTRUCTIONS AND MAINTENANCE MANUALS
23 05 18 PIPING: CONDENSATE DRAIN
23 05 48 VIBRATION ISOLATION EQUIPMENT
23 05 93 PERFORMANCE VERIFICATION, PRELIMINARY
23 05 94 PERFORMANCE VERIFICATION, FINAL
23 07 00 INSULATION, HVAC
23 23 13 REFRIGERANT PIPE, VALVES AND SPECIALTIES
23 31 00 DUCTWORK
23 33 00 DUCT SYSTEM ACCESSORIES
23 34 29 FANS: CENTRIFUGAL, CEILING MOUNTED
23 37 13 AIR DISTRIBUTION DEVICES
23 37 25 LOUVERS
23 41 00 AIR FILTER ASSEMBLIES

23 43 24 AIR PURIFICATION SYSTEM
23 54 17 HEATING COILS: ELECTRIC DUCT
23 81 44 AIR CONDITIONING UNITS, PACKAGED ROOFTOP

DIVISION 26 - ELECTRICAL

26 01 00 BASIC ELECTRICAL REQUIREMENTS
26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26 05 44 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23 LIGHTING CONTROL DEVICES
26 24 16 PANELBOARDS
26 27 13 ELECTRICITY METERING
26 27 26 WIRING DEVICES
26 28 13 FUSES
26 41 13 LIGHTNING PROTECTION FOR STRUCTURES
26 43 13 SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS
26 51 00 INTERIOR LIGHTING
26 56 00 EXTERIOR LIGHTING

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 31 11 DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM
23 81 44 AIR CONDITIONING UNITS, PACKAGED ROOFTOP

DIVISION 26 - ELECTRICAL

26 01 00 BASIC ELECTRICAL REQUIREMENTS
26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PRO ECT

A. Project Name: 18069_95 SW 5th Ave Development

B. Owner's Name: Palm Beach County.

C. Architect's Name: Song + Associates, Inc..

D. The Project consists of the construction of a new two-story CMU and precast joist and beams with poured floor slab shell structure. Housing 3 future tenant space build out areas. Along with covered parking garage tenant common areas. .

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 00 - Agreement Form.

1.03 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE

A. Construction Operations: Limited to areas noted on Drawings.
   1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

C. Existing building spaces may not be used for storage.

D. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to hours as agreed to with Palm Beach County.
   2. Limit conduct of hours as agreed to with Palm Beach County.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 10 00

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 SC EDULE OF VALUES

A. Use Schedule of Values Form: As agreed upon in Owner-Contractor Agreement..

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

H. Submit one electronic and three hard-copies of each Application for Payment.

I. Include the following with the application:
   1. Transmittal letter as specified for submittals in Section 01 30 00.
   2. Construction progress schedule, revised and current as specified in Section 01 30 00.
   3. Current construction photographs specified in Section 01 30 00.

4. Partial release of liens from major subcontractors and vendors.
5. Affidavits attesting to off-site stored products.

J. When Owner or Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 days.

D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 6000.

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
1. For change requested by Owner or Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Owner and Architect.

F. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
   a. Quantities of products, labor, and equipment.
   b. Taxes, insurance, and bonds.
   c. Overhead and profit.
   d. Justification for any change in Contract Time.
   e. Credit for deletions from Contract, similarly documented.
2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

J. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 20 00

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.03 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage) Current Edition.

B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase) Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. A Substitution Request for specified installer constitutes a representation that the submitter:
   1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. No specific form is required. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Official project name and number, and any additional required identifiers established in Contract Documents.

2) Owner's, Architect's, and Contractor's names.

b. Substitution Request Information:
   1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
   2) Indication of whether the substitution is for cause or convenience.
   3) Issue date.
   4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
   5) Description of Substitution.
   6) Reason why the specified item cannot be provided.
   7) Differences between proposed substitution and specified item.
   8) Description of how proposed substitution affects other parts of work.

c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
   1) Physical characteristics.
   2) In-service performance.
   3) Expected durability.
   4) Visual effect.
   5) Warranties.
   6) Other salient features and requirements.
   7) Include, as appropriate or requested, the following types of documentation:
      (a) Product Data:
      (b) Samples.
      (c) Certificates, test, reports or similar qualification data.
      (d) Drawings, when required to show impact on adjacent construction elements.

d. Impact of Substitution:
   1) Savings to Owner for accepting substitution.
   2) Change to Contract Time due to accepting substitution.

E. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Architect will consider requests for substitutions only within 15 days after date of Agreement.

B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

C. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
   2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
   3. Bear the costs engendered by proposed substitution of:
      a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
      b. Other construction by Owner.
      c. Other unanticipated project considerations.

D. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
   2. Without a separate written request.
   3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION 01 25 00

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Construction progress schedule.
G. Contractor's daily reports.
H. Progress photographs.
I. Coordination drawings.
J. Submittals for review, information, and project closeout.
K. Number of copies of submittals.
L. Requests for Interpretation (RFI) procedures.
M. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.

1.03 REFERENCE STANDARDS

A. AIA G716 - Request for Information 2004.
B. AIA G810 - Transmittal Letter 2001.
C. CSI/CSC Form 12.1A - Submittal Transmittal Current Edition.
D. CSI/CSC Form 13.2A - Request for Information Current Edition.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect:
    1. Requests for Interpretation (RFI).
    2. Requests for substitution.
    3. Shop drawings, product data, and samples.
    4. Test and inspection reports.
    5. Design data.
    6. Manufacturer's instructions and field reports.
    7. Applications for payment and change order requests.
    8. Progress schedules.
    9. Coordination drawings.
    10. Correction Punch List and Final Correction Punch List for Substantial Completion.
    11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic

stamping and signatures, and notifies addressees via email.

1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Contractor and Architect are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Submittal Service: The selected service is:
   1. As agreed upon between Owner and Contractor.

C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Submission of initial Submittal schedule.
   6. Designation of personnel representing the parties to Contract, Owner and Architect.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

E. Record minutes and distribute PFD copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Owner.

3. Architect.
4. Contractor's superintendent.
5. Major subcontractors.

C. Agenda:
1. Use of premises by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Contractor's superintendent.
5. Major subcontractors.

D. Agenda:
1. Review minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of RFIs log and status of responses.
7. Review of off-site fabrication and delivery schedules.
8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SC EDULE - SEE SECTION 01 32 16

A. Within 10 days after date established in Notice to Proceed, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.06 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
   1. Date.
   2. High and low temperatures, and general weather conditions.
   3. List of subcontractors at Project site.
   4. List of separate contractors at Project site.
   5. Approximate count of personnel at Project site.
      a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
   6. Major equipment at Project site.
   7. Material deliveries.
   8. Safety, environmental, or industrial relations incidents.
   9. Meetings and significant decisions.
   10. Unusual events (submit a separate special report).
   11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
   12. Directives and requests of Authority(s) Having Jurisdiction (AHJ).
   13. Testing and/or inspections performed.
   14. Signature of Contractor's authorized representative.

3.07 PROGRESS P OTOGRAP S

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Completion of site clearing.
   2. Excavations in progress.
   3. Foundations in progress and upon completion.
   4. Structural framing in progress and upon completion.
   5. Enclosure of building, upon completion.
   6. Final completion, minimum of ten (10) photos.

E. Take photographs as evidence of existing project conditions as follows:
   1. Interior views: 8 minimum.
   2. Exterior views: 8 minimum.

F. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.

4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
5. Point of View Sketch: Provide sketch identifying point of view of each photograph.

G. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
1. Delivery Medium: Via email.
2. File Naming: Include project identification, date and time of view, and view identification.
3. Point of View Sketch: Include digital copy of point of view sketch with each electronic submittal; include point of view identification in each photo file name.
4. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.08 REQUESTS FOR INTERPRETATION RFI

A. Definition: A request seeking one of the following:
1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
1. Prepare a separate RFI for each specific item.
a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
b. Do not forward requests which solely require internal coordination between subcontractors.
2. Prepare in a format and with content acceptable to Owner.
a. Use AIA G716 - Request for Information .
b. Use CSI/CSC Form 13.2A - Request for Interpretation.
3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
a. Approval of submittals (use procedures specified elsewhere in this section).
b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.
   3. Highlight items requiring priority or expedited response.
   4. Highlight items for which a timely response has not been received to date.
   5. Identify and include improper or frivolous RFIs.

H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.09 SUBMITTAL SC EDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 32 16 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.

4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.10 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
    1. Product data.
    2. Shop drawings.
    3. Samples for selection.
    4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.11 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
    1. Design data.
    2. Certificates.
    3. Test reports.
    4. Inspection reports.
    5. Manufacturer's instructions.
    6. Manufacturer's field reports.
    7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.12 SUBMITTALS FOR PRO ECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
    1. Project record documents.
    2. Operation and maintenance data.
    3. Warranties.
    4. Bonds.
    5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.13 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
    1. After review, produce duplicates.
    2. Retained samples will not be returned to Contractor unless specifically so stated.

3.14 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Transmit using approved form.
   4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Upload submittals in electronic form to Electronic Document Submittal Service website.
      b. Deliver physical samples to Architect at business address.
   8. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
      c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.
   9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   10. Provide space for Contractor and Architect review stamps.
   11. When revised for resubmission, identify all changes made since previous submission.
   12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
   14. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Do not reproduce Contract Documents to create shop drawings.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
   1. Transmit related items together as single package.
   2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.15 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
   1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "No Exceptions Taken", or language with same legal meaning.
      b. "Reviewed as noted", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
         2) Non-responsive resubmittals may be rejected.
      b. "Rejected".
         1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

END OF SECTION 01 30 00

SECTION 01 32 16
CONSTRUCTION PROGRESS SC EDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01 10 00 - Summary: Work sequence.

1.03 SUBMITTALS

A. Within 10 days after date established in Notice to Proceed, submit preliminary schedule.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit in PDF format.

1.04 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.05 SC EDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SC EDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules to define critical portions of the entire schedule.

E. Include conferences and meetings in schedule.

F. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

G. Indicate delivery dates for owner-furnished products.

H. Coordinate content with schedule of values specified in Section 01 20 00 - Price and Payment Procedures.

I. Provide legend for symbols and abbreviations used.

3.03 BAR C ARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SC EDULE

A. Participate in joint review and evaluation of schedule with Owner and Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SC EDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.06 DISTRIBUTION OF SC EDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION 01 32 16

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Contractor's design-related professional design services.

G. Control of installation.

H. Mock-ups.

I. Tolerances.

J. Manufacturers' field services.

K. Defect Assessment.

1.02 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants 2008 (Reapproved 2019).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2019.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.

G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components 2016.

H. IAS AC89 - Accreditation Criteria for Testing Laboratories 2020.

1.03 DEFINITIONS

A. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.

1. Design Services Types Required:
    a. Construction-Related: Services Contractor needs to provide in order to carry out the Contractor’s sole responsibilities for construction means, methods, techniques, sequences, and procedures.
    b. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.

B. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.04 CONTRACTOR S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
   1. Temporary sheeting, shoring, or supports.
   2. Temporary scaffolding.
   3. Temporary bracing.
   4. Temporary foundation underpinning.
   5. Temporary stairs or steps required for construction access only.
   6. Temporary hoist(s) and rigging.

1.05 CONTRACTOR S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Base design on performance and/or design criteria indicated in individual specification sections.
   1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.

C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
   1. Structural Design of Reinforcement Splices: As described in Section 03 01 00 - Maintenance of Concrete.
   2. Structural Design of Formwork: As described in Section 03 10 00 - Concrete Forming and Accessories.
   3. Structural Calculations and Design: As described in Section 03 41 00 - Precast Structural Concrete.
   4. Concrete Mix and Structural Design: As described in Section 03 45 00 - Precast Architectural Concrete.
   5. Concrete Mix and Structural Design: As described in Section 03 47 13 - Tilt-Up Concrete.
   6. Structural Design of Steel Connections: As described in Section 05 12 00 - Structural Steel Framing.
   7. Structural Design of Steel Connections: As described in Section 05 21 00 - Steel Joist Framing.
   8. Structural Design of Steel Decking: As described in Section 05 31 00 - Steel Decking.
   9. Structural Design of Stairs: As described in Section 05 51 00 - Metal Stairs.
   10. Structural Design of Railings: As described in Section 05 52 13 - Pipe and Tube Railings.
   11. Structural Design: Include physical characteristics, engineering calculations, and resulting dimensional limitations as described in Section 08 43 13 - Aluminum-Framed Storefronts.
   12. Structural Design: Include calculations for resisting wind loads, anchor locations, loads at points of attachment to building structure, physical characteristics, resulting dimensional limitations as described in Section 08 44 13 - Glazed Aluminum Curtain Walls.
   13. Structural Design and Calculations: As described in Section 10 71 13.43 - Fixed Sun Screens.
   14. Structural Design of Canopy: As described in Section 10 73 16.13 - Metal Canopies.
   15. Structural Design of Foundation: As described in Section 10 75 00 - Flagpoles.
   16. Sprinkler Layout: Coordinate with ceiling installation, detailed pipe layout, and hydraulic calculations as described in Section 21 13 00 - Fire-Suppression Sprinkler Systems.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for Owner's information.
   1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
      a. Full name.

b. Professional licensure information.
c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

C. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
2. Include required product data and shop drawings.
3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.

D. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Compliance with Contract Documents.
k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

E. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

F. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

G. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

H. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications:
1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a

Professional Engineer experienced in design of this type of work and licensed in Florida.

1.08 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.09 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Contractor Employed Agency:
   1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
   2. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
   3. Laboratory: Authorized to operate in Florida.
   4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
   5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.

D. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

E. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

F. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
   1. Architect will issue written comments within seven (7) working days of initial review and each subsequent follow up review of each mock-up.
   2. Make corrections as necessary until Architect's approval is issued.

G. Architect will use accepted mock-ups as a comparison standard for the remaining Work.

H. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

I. Where possible salvage and recycle the demolished mock-up materials.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3. Perform specified sampling and testing of products in accordance with specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   6. Perform additional tests and inspections required by Architect.
   7. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
    a. To provide access to Work to be tested/inspected.
    b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    c. To facilitate tests/inspections.
    d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION 01 40 00

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering
B. Temporary utilities.
C. Temporary telecommunications services.
D. Temporary sanitary facilities.
E. Temporary Controls: Barriers, enclosures, and fencing.
F. Security requirements.
G. Vehicular access and parking.
H. Waste removal facilities and services.
I. Project identification sign.
J. Field offices.

1.02 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.
B. Maintain temporary facilities in operable condition.

1.03 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
B. Existing facilities may not be used.
C. New permanent facilities may be used.
D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
    1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
    2. Internet Connections: Minimum of one; DSL modem or faster.
    3. Email: Account/address reserved for project use.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.06 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Provide protection for plants designated to remain. Replace damaged plants.
D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.08 EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.09 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.10 VE ICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and Owner.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Designated existing on-site roads may be used for construction traffic.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

F. Do not allow vehicle parking on existing pavement.

G. Designate one parking space for Owner and Architect use.

1.11 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PRO ECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.

B. Erect on site at location established by Architect.

C. No other signs are allowed without Owner permission except those required by law.

1.13 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 8 persons.

C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 50 00

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Transportation, handling, storage and protection.

B. Product option requirements.

C. Substitution limitations.

D. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

B. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

C. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1. Made outside the United States, its territories, Canada, or Mexico.
   2. Made using or containing CFC's or HCFC's.
   3. Made of wood from newly cut old growth timber.
   4. Containing lead, cadmium, or asbestos.

C. Where other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 61 16.
   2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Result in less construction waste. See Section 01 74 19
   6. Are made of vegetable materials that are rapidly renewable.
   7. Are made of recycled materials.
   8. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
   9. If bio-based, other than wood, are or are made of Sustainable Agriculture Network certified products.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

3.02 TRANSPORTATION AND ANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.

1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Provide off-site storage and protection when site does not permit on-site storage or protection.

H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

I. Comply with manufacturer's warranty conditions, if any.

J. Do not store products directly on the ground.

K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

L. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

M. Prevent contact with material that may cause corrosion, discoloration, or staining.

N. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

O. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 60 00

SECTION 01 61 16
VOLATILE ORGANIC COMPOUND VOC CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Indoor-Emissions-Restricted products.

B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings applied on site.
   2. Interior adhesives and sealants applied on site, including flooring adhesives.
   3. Flooring.
   4. Composite wood.
   5. Products making up wall and ceiling assemblies.
   6. Thermal and acoustical insulation.

B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings applied on site.
   2. Interior adhesives and sealants applied on site, including flooring adhesives.

C. Interior of Building: Anywhere inside the exterior weather barrier.

D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.
   6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.

B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings 2005 (Reapproved 2018).

C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers 2017, v1.2.

D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board 2007.

E. CHPS (HPPD) - High Performance Products Database Current Edition at www.chps.net/.

F. CRI (GLP) - Green Label Plus Testing Program - Certified Products Current Edition.

G. SCAQMD 1113 - Architectural Coatings 1977 (Amended 2016).

H. SCAQMD 1168 - Adhesive and Sealant Applications 1989 (Amended 2017).

I. SCS (CPD) - SCS Certified Products Current Edition.

J. UL (GGG) - GREENGUARD Gold Certified Products Current Edition.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.06 QUALITY ASSURANCE

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following;
      a. Current UL (GGG) certification.
      b. Current SCS (CPD) Floorscore certification.
      c. Current SCS (CPD) Indoor Advantage Gold certification.
      d. Current listing in CHPS (HPPD) as a low-emitting product.
      e. Current CRI (GLP) certification.
      f. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. VOC-Content-Restricted Products: VOC content not greater than required by the following:
   1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
   2. Joint Sealants: SCAQMD 1168 Rule.
   3. Paints and Coatings: Each color; most stringent of the following:
      a. 40 CFR 59, Subpart D.
      b. SCAQMD 1113 Rule.
      c. CARB (SCM).

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION 01 61 16

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.
      d. Description of proposed work and products to be used.
      e. Effect on work of Owner or separate Contractor.
      f. Written permission of affected separate Contractor.
      g. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.03 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in Florida and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Florida. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Florida.

1.04 PRO ECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Perform dewatering activities, as required, for the duration of the project.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 6 pm to 7 am.

H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

PART 2 PRODUCTS

2.01 PATC ING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work,

assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT T E WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Control datum for survey is that established by Owner provided survey.

E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

H. Utilize recognized engineering survey practices.

I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
   4. Controlling lines and levels required for mechanical and electrical trades.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATC ING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.11 AD USTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.12 FINAL CLEANING

A. Execute final cleaning after Substantial Completion but before making final application for payment.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.14 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01 70 00

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood.
   5. Land clearing debris, including brush, branches, logs, and stumps; see Section 31 10 00 - Site Clearing for use options.
   6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

F. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.
   5. Incineration, either on- or off-site.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

E. Section 31 10 00 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
      c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
      e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
   5. Material Reused on Project: Include the following information for each:

a. Identification of material and how it was used in the project.
b. Amount, in tons or cubic yards.
c. Include weight tickets as evidence of quantity.

6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 70 00 for trash/waste prevention procedures related to cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
1. Prebid meeting.
2. Preconstruction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
1. Provide containers as required.
2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 01 74 19

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRO ECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.

2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINIS ES

A. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Additional information as specified in individual product specification sections.

D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION 01 78 00

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 02 65 00 - Underground Storage Tank Removal.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of five years of documented experience.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Remove the entire building designated PBSO Marine.

B. Remove paving and curbs as required to accomplish new work.

C. Break up paving within site boundaries to permit natural moisture drainage; leave pieces not larger than 1 square yard.

D. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

E. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

F. Break up concrete slabs on grade within site boundaries to permit natural moisture drainage; leave pieces not larger than 1 square yard.

G. Remove underground tanks.

H. Remove manholes and manhole covers, curb inlets and catch basins.

I. Remove fences and gates.

J. Remove creosote-treated wood utility poles.

K. Remove other items indicated, for salvage, relocation, and recycling.

L. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PRO ECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

G. Underground Storage Tanks: Remove and dispose of as specified in Section 02 65 00.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 41 00

SECTION 02 65 00
UNDERGROUND STORAGE TANK REMOVAL

UPDATE NOTES

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Removal and disposal of underground storage tanks and connected piping.

B. Cleaning and vapor freeing of tanks.

C. Fuel removal.

D. Temporary containment of excavated soil.

E. Testing soils for contamination.

F. Disposal of contaminated soil.

G. Water disposal.

H. Providing reports required by regulatory agencies.

I. Backfilling.

2.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Dewatering of excavations and water control.

B. Section 02 41 00 - Demolition.

2.03 REFERENCE STANDARDS

A. API RP 1604 - Closure of Underground Petroleum Storage Tanks 2021.

B. API PUBL 1628 - Guide to the Assessment and Remediation of Underground Petroleum Releases 1996.

C. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications 2016.

D. 29 CFR 1910 - Occupational Safety and Health Standards current edition.

E. 29 CFR 1910.38 - Emergency action plans current edition.

F. 40 CFR 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks current edition.

G. COE EM-385-1-1 - Safety and Health Requirements Manual 2014.

H. EPA SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods Current Edition.

I. EPA 600-4-790-20 - Methods for Chemical Analysis of Water and Wastes 1983.

2.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Site Safety and Health Plan: Describe safety and health plan and procedures as related to underground tank removal and pipe removal, and as related to operations associated with petroleum contaminated soils and water.

C. Excavation and Material Handling Plan: Describe methods, means, equipment, sequence of operations and schedule to be employed in excavation, transport, handling, and stockpiling of soil during underground tank removal.
   1. Submit to Architect fifteen days before beginning tank removal work.
   2. Include a material handling plan that describes phases of dealing with the contaminated soil and water as it relates to the proposed tank and piping removal.
   3. Include methods of excavating, a material handling plan for the contaminated material, soil testing requirements, safety precautions and requirements, and water pumping and collection requirements.

D. Field Sampling and Laboratory Testing Plan: Describe field sampling methods and quality control procedures.
   1. Identify laboratory and laboratory methods to be used for contamination testing.
   2. Sample reports shall show sample identification for location, date, time, sample method, contamination level, name of individual sampler, identification of laboratory, and quality control procedures.

E. Tank and Piping Removal and Disposal Plan: Describe methods, means, sequence of operations, and schedule to be employed in the testing, pumping, cleaning, de-vaporizing, inspecting, removal, and disposal of underground storage tanks and piping.

F. Spill and Discharge Control Plan: Describe procedures and plan related to potential spills and discharge of contaminated soils and water.

G. Reports:
   1. Identification of tanks removed and disposed of, including site map showing location of tank and piping.
   2. Starting and ending dates of reporting period.
   3. Closure report. Incorporate reports, records, and data into a single binder with the title "SITE ASSESSMENT REPORT" on the cover of the binder.
   4. Laboratory testing reports, including location of soil excavated and associated OVA/FID (organic vapor analyzer/flame ionization device) readings, and sampling and test results for:
      a. TPH (total petroleum hydrocarbons).
      b. BTEX (benzene, toluene, ethylbenzene, and xylene).
      c. TCLP (toxicity characteristic leaching procedure); if BTEX indicates gasoline, then provide TCLP.
   5. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

H. Record Documents:
   1. Building permit, inspection permits, and other permits required for underground tank removal.
   2. Results of excavation, including sketch showing location of underground storage tank, sampling locations, and extent of excavation.
   3. Tank disposal paperwork, such as copy of UST Notification Form and method of conditioning tank for disposal.
   4. Contaminated soil disposal paperwork, such as laboratory testing reports.
   5. Contaminated water disposal paperwork, such as laboratory testing results.

2.05 QUALITY ASSURANCE

A. Perform work in accordance with local, state, and federal regulations and 40 CFR 280.

B. Qualifications: Prior to start of work, submit documentation of recent experience and resumes of personnel working on the project.
   1. Data shall indicate that tank removal contractor, subcontractors, and personnel employed on the project have been engaged in removal, transportation, and disposal of underground tanks and associated piping, are familiar with and shall abide with the following:
      a. API RP 1604.
      b. 40 CFR 280 and State and local regulations and procedures.
      c. Applicable safety rules and regulations.
      d. Use of equipment and procedures for testing and vapor-freeing tanks.
      e. Handling and disposal of types of wastes encountered in underground tank and pipe removal including disposal of underground tanks and associated piping.
      f. Excavation, testing, and disposal of petroleum contaminated soils, liquids, and sludge.
      g. Provide documentation that tank removers are certified if locality of project has this requirement.

2. Furnish the name and qualifications of the proposed Site Safety and Health Officer, based on education, training, and work experience.

C. References: Furnish data proving experience on at least three prior projects that included types of activities similar to those in this project. Provide project titles, dates of projects, owners of projects, point of contact for each project, and phone numbers of each point of contact.

PART 2 PRODUCTS

3.01 MATERIALS

A. Plastic Sheeting: ASTM D4397.

PART 3 EXECUTION

4.01 PREPARATION FOR TANK REMOVAL AND DISPOSAL

A. Site Safety And Health Plan (SSHP): Furnish safety, health, and accident prevention provisions and develop a Site Safety and Health Plan (SSHP).
   1. The SSHP shall incorporate the requirements of 29 CFR 1910 and COE EM-385-1-1.
   2. Site work shall not start until the SSHP is approved by the Architect.

B. Site Safety And Health Officer: Identify an individual to serve as the Site Safety and Health Officer (SSHO) who is a Certified Industrial Hygienist (CIH).
   1. The SSHO CIH shall report problems and concerns regarding health and safety to the Architect.
   2. The SSHO CIH shall have a working knowledge of local and Federal occupational safety and health regulations, and shall provide training to Contractor employees in air monitoring practices and techniques.
   3. The SSHO CIH shall also provide day to day industrial hygiene support, including air monitoring, training, and daily site safety inspections.
   4. The SSHO CIH shall be trained in the use of the monitoring and sampling equipment, interpretation of data required to implement the SSHP, and to administer the elements of the SSHP.
   5. The SSHO CIH shall remain on site during project operations and may be assigned other duties, such as project foreman or quality control manager.

C. Spill And Discharge Control Plan: Develop, implement, and maintain a comprehensive spill and discharge control plan.
   1. The plan shall provide contingency measures for potential spills and discharges from handling and transportation of contaminated soils and water.
   2. A possible source of guidance for assessment and remediation is API PUBL 1628.

D. Exclusion Zone (EZ) And Contamination Reduction Zone (CRZ): Do not permit personnel not directly involved with the project to enter work zones, called the EZ and CRZ.
   1. The EZ shall be an area around the tank a minimum of 10 feet from the limits of the tank excavation.
   2. At the perimeter of the EZ, establish a CRZ.
   3. The Contractor's site office, parking area, and other support facilities shall be located outside the EZ and CRZ.
   4. Clearly mark and post the boundaries of the EZ and CRZ.
   5. Include a site map, outlining the extent of work zones and location of support facilities, in the SSHP.

E. Personnel Protection: Furnish appropriate personal safety equipment and protective clothing to personnel.
   1. Ensure that safety equipment and protective clothing is kept clean and well maintained.

F. Decontamination: Decontaminate or properly dispose of personal protective equipment and clothing worn in contaminated areas at the end of the work day.
   1. The SSHO CIH shall be responsible for ensuring that personal protective clothing and equipment are decontaminated before being reissued.

G. First Aid And Emergency Response Equipment And Procedures: Provide appropriate emergency first aid equipment for treatment of exposure to site physical and chemical hazards.

1. Provide and post a list of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts.
2. Provide and post a route map detailing the directions to the nearest medical facility.

H. Ignition Sources: Do not permit ignition sources in the EZ and CRZ.

I. Waste Disposal: The SSHP shall detail the practices and procedures to be utilized to dispose of wastes. Upon completion of the project, certify that equipment and materials were properly decontaminated prior to being removed from the site.

J. Emergency Response Requirements: Furnish emergency response and contingency plan in accordance with 29 CFR 1910.38.
1. In an emergency, take action to remove or minimize the cause of the emergency, alert the Architect, and institute necessary measures to prevent repetition of the emergency.
2. Equip site-support vehicles with route maps providing directions to the medical treatment facility.

K. Unforeseen Hazards: Notify the Architect of any unforeseen hazard or condition that becomes evident during work.

4.02 TANK CLEANING

A. Fuel Removal:
1. All possible fuel will be pumped or otherwise removed from the tank by Owner.
2. Consider remaining fuel contaminated or waste fuel; pump into 55 gallon drums or other suitable containers for disposal in accordance with approved procedures meeting local, state, and federal regulations.
   a. Drums or tanks used for containerizing waste fuel shall be furnished by Contractor.
3. Dispose of remaining fuel emulsions in accordance with applicable local, state, and federal regulations.

4.03 TEMPORARY CONTAINMENT OF EXCAVATED SOIL

A. Provide temporary containment area near the excavated area.

B. Cover containment area with 30 mil polyethylene sheeting.
1. Place excavated soil on the impervious barrier and cover with 6 mil polyethylene sheeting.
2. Provide straw bale berm around the outer limits of the containment area and cover with polyethylene sheets.
3. Secure edges of sheets to keep the polyethylene sheeting in place.

4.04 EXCAVATION

A. Provide Architect with written documentation, no later than 30 days before work begins, that proper state or local authorities have been notified.

B. Notify Architect at least 48 hours prior to start of tank removal work.
1. Stage operations to minimize the time that tank excavation is open and the time that contaminated soil is exposed to the weather.
2. Provide protection measures around the excavation area to prevent water runoff and to contain the soil within the excavation area.

C. Excavation: Excavate as required to remove tanks and piping.
1. Place soil removed from the excavation in a temporary containment area.
2. Collect and temporarily store water runoff from stockpiled soils.

D. Excavation Methods: Select methods and equipment to remove soil to minimize disturbance to areas beyond the limits of the excavation area.
1. Material that becomes contaminated as a result of Contractor's operations shall be removed and disposed of at no additional cost to Owner.
2. Where excavation extends into groundwater levels, dewatering methods shall be employed on a localized basis to facilitate excavation operations, as specified in Section

01 70 00.

3. Water generated by dewatering during excavation required for removal of tanks or piping, surface water collected in open excavation, or water used for washing equipment or existing concrete or bituminous surfaces, shall be collected and tested.
   a. Test in accordance with EPA SW-846 and EPA 600-4-790-20 and state or locally required analyses.
   b. Water that contains contaminants above locally acceptable levels shall be disposed of in accordance with federal, state, and local regulations.
   c. Non-contaminated water may be disposed of on-site.

E. Structures: During excavation activities, if asphalt pavement, concrete slabs, or other structures are encountered, remove and wash with high pressure water cleaning equipment.
   1. Remove and dispose of pavement, concrete, and other structures as specified in Section 02 41 00.

4.05 TESTING

A. Stockpiled Soils: Soils with OVA/FID readings of 10 ppm or greater shall be further sampled and tested.
   1. Test for TPH and for BTEX in accordance with EPA SW-846 and EPA 600-4-790-20.
   2. Test for toxicity characteristic leaching procedure (TCLP) for lead if leaded gasoline was stored in or near the underground tank being removed.
   3. For TPH, provide a minimum of one test for every 100 cubic yards.
   4. For BTEX and TCLP, provide one test for every 100 cubic yards.
   5. Soils that contain 50 ppm or more TPH, 10 ppm or more BTEX or have TCLP reading of 10 ppm lead or virgin petroleum products are considered contaminated materials.
   6. Soils that test at levels less than the above may be used as clean fill.
   7. Furnish results to Architect within 24 hours after the results are obtained.

B. Testing Under Tank After Removal of Tank:
   1. If tank is 20 feet or less in length, take two samples. Each sample shall be 2 feet from each end of the tank and 2 feet below the bottom of the excavation.
   2. If the tank is greater than 20 feet, take three samples. Two samples shall be 2 feet from each end of the tank and 2 feet below the bottom of the excavation. A third sample shall be taken from the middle of the tank area and 2 feet below the bottom of the excavation.
   3. Analyze samples for TPH, BTEX, and TCLP.
   4. Comply with standards for sampling and analysis as specified above for stockpiled soils.
   5. Test for TPH and for BTEX in accordance with EPA SW-846 and EPA 600-4-790-20.
   6. Soils that contain 50 ppm or more TPH, 10 ppm or more BTEX, or have TCLP reading of 10 ppm of lead or virgin petroleum products are considered contaminated materials.
   7. Soils that test at levels less than the above may be used as clean fill.
   8. Furnish results to Architect within 24 hours after the results are obtained.
   9. Along with the results furnish a sketch showing underground tank, sampling location, and extent of excavations.

C. Testing Along Piping:
   1. For every 25 linear feet of product delivery piping, for every change in direction, and at every mechanical joint take one soil sample and analyze for TPH, BTEX, and TCLP.
   2. Comply with requirements for sampling and analysis of soil materials as specified above in the paragraph entitled "Testing Under Tank After Removal of Tank."

4.06 WATER DISPOSAL

A. Dewatering will be permitted only with approval of Architect.

B. Store and test water generated during removal of tanks and piping.
   1. If contaminated, transport and dispose of water in an EPA approved disposal site in accordance with federal, state, and local requirements.
   2. Non-contaminated water may be disposed of on-site.

4.07 DISPOSAL OF UNDERGROUND TANKS AND ASSOCIATED PIPING

A. Preparation: API RP 1604. Remove the fill pipe, gauge pipe, vapor recovery truck connection, submersible pumps, and drop tube.
   1. Cap or remove non-product piping, except vent piping.
   2. Plug tank openings so that vapors will exit through vent piping during the vapor-freeing process.

B. Purging: Remove flammable vapors in accordance with API RP 1604. Tanks shall be certified as "vapor free" prior to further work.

C. Cleaning and Testing: Clean tank and perform atmosphere testing in accordance with API RP 1604.
   1. Distribution (product delivery) piping shall be cleaned and removed or the piping shall be cleaned, filled with concrete, and abandoned in place.
   2. Test the tank atmosphere and the excavation area for flammable or combustible vapor concentrations, with a combustible gas indicator until the tank is removed from the excavation and from the site.

D. Tank Removal and Disposal:
   1. Plug or cap accessible holes. One plug shall have a minimum 1/8 inch vent hole.
   2. Remove tank from the excavation, place it on a level surface and render it useless in accordance with API RP 1604.
   3. Provide warning labels on tank if tank contained leaded fuels, as follows:
      a. "TANK HAS CONTAINED LEADED GASOLINE -- NOT VAPOR FREE -- NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION -- DATE OF REMOVAL: MONTH/DAY/YEAR"
   4. Transport and dispose of tank at an EPA approved disposal site in accordance with federal, state, and local regulations.

4.08 INSPECTIONS

A. Arrange for and perform required inspections. Provide copies of inspections to the Architect.

4.09 CLOSURE REPORT SITE ASSESSMENT REPORT

A. Provide Architect a Site Assessment Report in a single binder notebook that contains the full collection of reports relating to this work, including but not limited to, records, starting and ending dates of reporting period, inspections, documentation, and data as follows:
   1. Complete UST Notification Form (within 30 days of closure).
   2. Description of work, including removal procedures, number of tanks removed, identification of tanks removed and disposed of, cubic yards of excavated soil, location of disposal sites, and dates of excavation.
   3. Site plan, including location of tanks and piping, limits of excavation, sampling points, results of excavation, and depths.
   4. Laboratory testing reports, copies of data and test results from testing laboratory.
   5. Tank disposal paperwork, contaminated soil disposal paperwork, and contaminated water disposal paperwork.
   6. Certifications required by implementing agency.
   7. Building permit, inspection permits, and other permits required for underground tank removal, notifications, and inspection reports.
   8. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

4.10 SPILLS OF CONTAMINATED SOILS

A. Use appropriate vehicles and operating practices to prevent spillage or leakage of contaminated materials from occurring during operations. Inspect vehicles leaving the area of contamination to ensure that no contaminated materials adhere to the wheels or undercarriage.

4.11 BACKFILLING

A. Provide backfill, compaction, grading, and seeding in accordance with 31 23 23.

END OF SECTION 02 65 00

SECTION 03 11 00
CONCRETE FORMWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2 FORMWORK FOR CONCRETE
- A. Related accessories

1.3 REFERENCES
- A. ACI 301 - Specifications for Structural Concrete Buildings
- B. ACI 318 - Building Code Requirements for Structural Concrete
- C. ACI 347 - Guide to Formwork for Concrete
- D. ACI SP-4: Formwork for Concrete
- E. ASME A17.1 - Safety Code for Elevators and Escalators
- F. ASTM E1643 - -Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
- G. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- H. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

1.4 SYSTEM DESCRIPTION
- A. Concrete Formwork: For surfaces of cast-in-place concrete to be unexposed or to receive rubbed finish.
- B. Form footings and slabs on grade, earth forming are not allowed.
- C. Design/Performance Requirements: Design, engineering and construction of formwork and shoring is the responsibility of the Contractor.
  1. Design formwork with sufficient strength to withstand forces due to placement and vibration and sufficient rigidity to maintain specified tolerances.
  2. Design loads, lateral pressure, and allowable stresses in accordance with ACI 347.

1.5 SUBMITTALS
- A. Product Data: Proprietary materials and items, including forming accessories, water stops, joint systems, and others
- B. Structural Calculations (Threshold Buildings):
  1. Prepare and submit complete design calculations, plans, and details for shoring and re-shoring procedures, indicating conformance to specified performance and design criteria; signed, and sealed by a professional engineer registered in the State of Florida.
  2. Submit calculations for review information only, will not check for accuracy

PART 2 PRODUCTS

2.1 FORM MATERIALS
- A. Concrete Forms for Beams, Columns, and Slabs:
  1. New or properly reconditioned material designed to conform to requirements of ACI SP-4 and to support wet concrete without deflection.
  2. Plywood Panels: PS-1 B-B plywood, Class 1, EXT-APA, sanded, mill oiled, and edge sealed.
- B. Structural Concrete Forms for Joists: New or properly reconditioned removable 18-gauge steel or fiberglass pan forms with tapered end closures.
- C. Cylindrical Column Forms:

1. Metal, fiberglass reinforced plastic, or paper or fiber tubes.
2. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection.
    a. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.

2.2 RELATED MATERIALS

A. Vapor Retarder: Related section 07 26 00.
B. Form Coatings: Colorless commercial formulation form release and sealer compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
C. Form Ties: Adjustable length, removable or snap off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal, 1½" break back, and maximum hole left 1¼" diameter.
D. Bevels and Rustications: Wood strips milled to shapes indicated or formed rigid plastic strips.
E. Dovetail Anchor Slots: 24-ga. galvanized steel with release tape sealed slots and bent tab anchors.
F. Flashing Reglets shall be 16-oz. copper with release tape sealed slots and alignment splines at end joints.
G. Construction Joints shall be 24-ga. galvanized steel keyway form type with knockout holes spaced 6" o. c. to receive doweling.
H. Carton Forms: Fiberboard void boxes capable of supporting min. load of 600 lbs./sq ft
I. Form Joint System for Architectural Concrete Forms:
    1. Gaskets shall be closed cell foam tape - Source Product/Mfg. - No. 4016 by 3M.
    2. Caulk: Rubberized, non-staining silicone compound GE Product/Mfg. - No. 1201.
    3. Tape: 2-mil Mylar - source Product/Mfg. - No. 371 by 3M.
J. Mastic Water stop: Preformed plastic or butyl resin strips. Source Products/Mfg:
    1. Synko-Flex/Synko-Flex Products Co.
    2. ConSeal CS-102/Concrete Sealants
K. Joint Fillers: Pre-molded mastic strips, asphalt impregnated, ASTM D1751.
L. Fasteners and Anchorages: Nails, spikes, bolts, lag bolts, and other types sized as required to maintain formwork in place.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels, and measurements required before proceeding with formwork.
B. Coordinate the installation of joint materials, reinforcing steel, and vapor retarders with placement of forms.

3.2 INSTALLATION TOLERANCES

A. Allowable tolerances for Structural Concrete Forms shall comply with ACI 301 and 347.
B. Allowable tolerances for camber in slabs and beams shall comply with ACI 301.
C. Allowable tolerances for plumbness in elevator shafts shall comply with requirements of ASME A17.1.

3.3 ERECTION

A. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that may occur before permanent bracing can support such loads.
B. Construction:

1. Construct formwork so finished concrete members and structures are of correct size, shape, alignment, elevation, and position.
2. Build formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
3. Provide openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required.
4. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
5. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
6. Provide temporary openings at bottoms of forms to facilitate cleanout and inspection.
    a. Close openings with tight fitting panels and neat joints so that joints will not be apparent in exposed concrete surfaces.

C. Chamfer exposed corners and edges as indicated, or if not indicated, provide ¾" x ¾".
D. Provide openings in concrete formwork to accommodate work of other trades.
    1. Determine size and location of openings, recesses, and chases from trades providing such items.
    2. Accurately place and securely support items built into forms.
E. Thoroughly clean forms and adjacent surfaces to receive concrete.
    1. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete.
    2. Retighten forms and bracing after concrete placement to eliminate mortar leaks and maintain proper alignment.
F. Construction Joints:
    1. Locate and install formed construction joints at rustications or, if not indicated, locate so as not to impair strength and appearance of the structure, and as approved by the A/E.
    2. Provide keyways at least 1½" deep in construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
    3. Place construction joints perpendicular to main reinforcement.
        a. Continue reinforcement across construction joints, except as otherwise indicated.
G. Isolation Joints in Slabs-on-Ground: Construct continuous joint filler at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundations walls, grade beams, and elsewhere as indicated.
H. Water stops: Provide mastic water stops in construction joints of below grade walls and in joints between below grade slabs and walls.
    1. Install water stops to form continuous diaphragm in each joint.
    2. Fabricate field joints in water stops in accordance with manufacturer's printed instructions.
I. Form Coatings: Apply after erecting forms and sealing the joints but prior to placing reinforcing steel, anchoring devices, and embedded items.
    1. Seal surfaces of wood rustications with two coats of form sealer.
    2. Spray-apply one coat of release agent to formwork faces except concrete surfaces scheduled to receive special finishes or special coatings.
    3. Coat steel forms with a non-staining, rust- preventative form oil to protect against rusting.
        a. Rust-stained steel formwork is not acceptable.
J. Embedded Items: Set and build into work anchorage devices and other embedded items required for other work attached to, or supported by, cast-in-place concrete.

K. Reglets: Install to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
L. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E1643 and manufacturer's written instructions.

3.4 RE-USE OF FORMS
A. Clean re-used forms of concrete matrix residue, repair, and patch as required returning forms to acceptable surface condition.
B. Recoat contact surfaces of forms with a form-coating compound as specified.

3.5 SHORES AND SUPPORTS
A. Comply with ACI 347 for shoring and re-shoring in multistory construction, for beams, girders, raised slabs, and as herein specified.
B. Space all shoring in such a manner as to prevent any floor or member from excessive loading or inducing stress in any of the concrete members.
1. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.

3.6 REMOVAL OF FORMS AND SHORING
A. Remove formwork and shoring progressively and in accordance with ACI 301 and ACI 347 to prevent unbalanced loads on the structure.
B. Do not remove shoring and formwork until members have acquired strength as specified by the engineer of record.
1. Re-shore structural members as original shores are removed as specified by the engineer of record.
C. In the event the Contractor wishes to remove formwork at an earlier time than specified, the Contractor shall pay for and have testing laboratory obtain two additional concrete test cylinders to confirm strength requirement for early form removal.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete

1.2 REFERENCES
- A. ACI 301 - Structural Concrete for Buildings
- B. ACI 318 - Building Code Requirements For Reinforced Concrete
- C. ACI SP-66 - American Concrete Institute - Detailing Manual
- D. ASCE 7 - Minimum Design Loads of Buildings and Other Structures
- E. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- F. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
- G. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
- H. ASTM A496/A496M - Standard Specification for Steel Wire Deformed for Concrete Reinforcement
- I. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement Deformed for Concrete
- J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- K. ASTM A706/A706M - Standard Specification for Low Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
- L. ASTM A767/A767M- Standard Specification for Zinc Coated (Galvanized) Steel Bars for Concrete Reinforcement
- M. ASTM A775/A775M- Standard Specification for Epoxy Coated Reinforcing Steel Bars
- N. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy Coated Reinforcing Bars
- O. AWS D1.4 - Structural Welding Code-Reinforcing Steel
- P. CRSI - Concrete Reinforcing Steel Institute - Manual of Standard Practice
- Q. CRSI - Placing Reinforcing Bars
- R. FBC - Florida Building Code

1.3 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

1.4 SUBMITTALS FOR INFORMATION
- A. Section 01 33 00 - Submittals Procedures
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 DESIGN REQUIREMENTS
- A. Design shall comply with the FBC, ASCE 7 – Wind Loads, and ACI 318.
- B. Do not weld reinforcing steel.

1.6 QUALITY ASSURANCE
- A. Perform work in accordance with ACI 301. Maintain one copy of document on site.
- B. Design reinforcement under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

C. Submit under provisions of Section 01 40 00 Manufacturer's Certificates, certifying welders employed to do the work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60; deformed carbon steel bars, unfinished
B. Stirrup and Tie Steel: ASTM A615/A615M, Grade 40 or 60; deformed carbon steel bars, unfinished
C. Welded Steel Wire Fabric: ASTM A185/A185M Plain Type; in flat sheets and rolls; unfinished
D. Steel Wire: ASTM A82/A82M, plain, cold drawn, steel

2.2 ACCESSORIES

A. Tie Wire: Minimum 16 gage annealed type or patented system.
B. Chairs, Bolsters, Bar Supports, Spacers: Size and shape for strength and reinforcement support during concrete placement, include load bearing pad on bottom to prevent vapor barrier puncture.
C. Special Chairs, Bolsters, Bar Supports, and Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

2.3 FABRICATION

A. Fabricate concrete reinforcing in accordance with ACI 318.
B. Weld reinforcement in accordance with AWS D1.4.
C. Locate reinforcing splices not shown on plans, at point of minimum stress and review with A/E.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place support and secure reinforcement against displacement, without deviating from the required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Conform to applicable code for concrete cover over reinforcement.

3.2 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cast-in-place concrete building frame members, floors, shear walls, elevator shaft walls, foundation walls, footings, and supported slabs.
B. Floors and slabs on grade.
C. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.
D. Equipment pads, light pole base, flagpole base, thrust blocks, and manholes.

1.2 REFERENCES

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete
C. ACI 301 – Specifications Structural Concrete for Buildings
D. ACI 302.2R - Guide for Concrete Floor and Slab Construction
E. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete
F. ACI 305R - Hot Weather Concreting.
G. ACI 306R - Cold Weather Concreting.
H. ACI 308.1 - Standard Specification for Curing Concrete
I. ACI 318 - Building Code Requirements for Structural Concrete
J. ACI 347 - Guide to Formwork for Concrete
K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
L. ASTM C33/C33M - Standard Specification for Concrete Aggregates
M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete
O. ASTM C150/C150M - Standard Specification Portland Cement
P. ASTM C260/C260M - Standard Specification Air Entraining Admixtures for Concrete
Q. ASTM C330/C330M - Standard Specification Light Weight Aggregates for Structural Concrete
R. ASTM C494/C494 - Standard Specification for Chemical Admixtures for Concrete
S. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcinated Natural Pozzolan for Use in Concrete
T. ASTM C948 – Standard Test Method for Dry and Wet Bulk Density, Water Absorption and Apparent Porosity of Thin Sections of Glass-Fiber-Reinforced Concrete
U. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
V. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
W. ASTM D1751 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
X. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
Y. ASTM D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavement

Z. FBC - Florida Building Code
AA. Florida Department of Transportation - Standard Specifications for Road and Bridge Construction
BB. ASCE 7 – Minimum Design Loads for Buildings and other Structures.

1.3 RELATED SECTIONS
A. 31 20 00 Earth Moving
B. 31 31 16 Termite Control
C. 03 11 00 Concrete Formwork
D. 07 26 00 Vapor Retarders

1.4 SUBMITTALS FOR REVIEW and INFORMATION
A. Section 01 33 00 Submittals Procedures
B. Product Data: Provide data on joint devices, attachment accessories, admixtures, curing compound, sealers, and integral coloring.
C. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.
D. Samples: Submit two 12" long samples of expansion/contraction joint and control joint.
E. Shop Drawings:
1. Submit drawings indicating the locations of all joints in the concrete, construction joints, expansion joints, and contractions joints.
2. Include concrete placement schedule, method, sequence, quantities, location, and boundaries.

1.5 SUBMITTALS AT PROJECT CLOSEOUT
A. Section 01 77 00 Contract Closeout: Procedures for submittals
B. Accurately record actual locations of embedded utilities and components concealed from view.

1.6 DESIGN REQUIREMENTS
A. Design in conformance with Florida Building Code, ACI 318, and ACI 301.
B. Provide expansion joints, control joints, construction joints, and isolation joints to prevent uncontrolled stress cracks in the structure and according to the latest engineering standards.

1.7 QUALITY ASSURANCE
A. Perform Work in accordance with ACI 301.
B. Mix and deliver ready mixed concrete in accordance with ASTM C94/C94M.
C. Maintain one copy of each document on site.
D. Acquire cement and aggregate from same source for all work.
E. Conform to ACI 305R when concreting during hot weather.
F. Conform to ACI 306R when concreting during cold weather.

1.8 MOCK-UP
A. Comply with the requirements of section 01 40 00 Quality Control, Requirements for mock-up.
B. Construct and erect a field sample for architectural concrete surfaces receiving special treatment or finish as result of formwork.
C. Sample Panel: Sufficient size to indicate special treatment or finish required.
D. If requested by A/E, cast concrete against sample panel.
1. Obtain acceptance of resultant surface finish prior to erecting formwork.
E. Use the approved sample panel for basis of quality for the finished work.
1. Keep sample panel exposed to view for duration of concrete work.
F. Locate where directed.
G. Mock-up may not remain as part of the Work.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal, Portland type
B. Fine and Coarse Aggregates: ASTM C33/C33M
C. Lightweight Aggregate: ASTM C330/C330M
D. Water: Clean and not detrimental to concrete
E. Glass Fiber Reinforcement: ASTM C948

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260/C260M
B. Chemical: ASTM C494/C494M
   1. Water Reducing - Type A
   2. Retarding - Type B
   3. Accelerating - Type C
   4. Water Reducing and Retarding - Type D
   5. Water Reducing and Accelerating - Type E
   6. Water Reducing, High Range - Type F
   7. Water Reducing, High Range and Retarding - Type G
   8. Flowing Concrete - ASTM C1017/C1017M
C. Fly Ash: ASTM C618

2.3 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion, Polyvinyl Acetate, Latex emulsion, 2-component-modified epoxy resin, Non-solvent two-component polysulfide epoxy, Mineral filled polysulfide polymer epoxy, Mineral filled polysulfide polymer epoxy-resin, and Versamid cured epoxy.
B. Vapor Barrier: Flexible, sandwich of heavy paper, reinforced fibers, and two layers of inert polyethylene, formed into one layer under heat and pressure. (Perm rating of 0.1)
C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.4 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt
B. Joint Filler: ASTM D1752; Closed cell polyvinyl chloride foam, resiliency recovery of 95% if not compressed more than 50% of original thickness
C. Construction Joint Devices: Integral galvanized steel; formed to tongue and groove profile, with removable top strip exposing sealant trough, ribbed steel spikes with tongue to fit top screed edge.
D. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with a Shore A hardness of 35 to permit plus or minus 25% joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush mounted; color as selected.
E. Sealant and Primer: Type, as specified in Section 07 92 00
F. Sealant: Cold applied

2.5 CONCRETE MIX

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94/C94M
B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3

C. Select aggregate proportions for lightweight concrete in accordance with ASTM C330/C330M
D. Use accelerating admixtures in cold weather only when approved by A/E
   1. Use of admixtures will not relax cold weather placement requirements.
E. Use set retarding admixtures during hot weather only when approved by A/E
F. Add air-entraining agent to normal weight concrete mix for work exposed to exterior

PART 3 EXECUTION

3.1 EXAMINATION
   A. Verify site conditions under provisions of Section 01 31 00.
   B. Verify requirements for concrete cover over reinforcement.
   C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION
   A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
   B. In locations where doweling new concrete to existing work, drill holes in existing concrete; insert steel dowels and pack solid with non-shrink grout.
   C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.
   D. Remove all foreign matter and water from forms or structural excavations.

3.3 FORMWORK
   A. Conform to ACI 347
   B. Form foundations, earth forms not allowed, unless Engineer of record and the Soil's report can provide information to building official showing the soil conditions are conducive to earth forms.

3.4 PLACING CONCRETE
   A. Place concrete in accordance with ACI 301.
   B. Notify A/E minimum 24 hours prior to commencement of operations
   C. Ensure reinforcement, inserts, embedded parts, formed expansion, and contraction joints are not disturbed during concrete placement.
   D. Treat for termites per section 31 31 16.
   E. Install vapor retarder under interior slabs on grade, lap joints minimum 6", and seal watertight by taping edges and ends.
   F. Repair vapor retarder damaged during placement of concrete reinforcing.
      1. Repair with vapor retarder material; lay over damaged areas minimum 6" and seal watertight.
   G. Separate slabs on grade from vertical surfaces with joint filler.
   H. Place joint filler in floor slab pattern placement sequence.
      1. Set top to required elevations.
      2. Secure to resist movement by wet concrete.
   I. Extend joint filler from bottom of slab to within ¼" of finished slab surface.
      1. Conform to Section 07 92 00 for finish joint sealer requirements.
   J. Install joint devices in accordance with manufacturer's instructions.
   K. Install construction joint devices in coordination with floor slab pattern placement sequence.
      1. Set top to required elevations.
      2. Secure to resist movement by wet concrete.
   L. Install joint device anchors.

1. Maintain correct position to allow joint cover to be flush with floor and wall finish.

M. Install joint covers in one-piece length, when adjacent construction activity is complete.
N. Apply sealants in joint devices in accordance with Section 07 92 00.
O. Maintain records of concrete placement.
1. Record date, location, quantity, air temperature, and test samples taken.
P. Place concrete continuously between predetermined expansion, control, and construction joints.
Q. Do not interrupt successive placement; do not permit cold joints to occur.
R. Place floor slabs in checkerboard or saw cut pattern indicated.
S. Saw cut joints within 24 hours after placing.
1. Use $^{3}/_{16}$" thick blade, cut into ¼ depth of slab thickness.
T. Screed floors and slabs on grade level, maintaining surface flatness of maximum ⅛" in 10'.

3.5 SEPARATE FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface, and remove deleterious material, broom and vacuum clean.
B. Place dividers, edge strips, reinforcing, and other items being cast in the pour as required.
C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
D. Place concrete floor toppings to required lines and levels.
E. Place topping in checkerboard panels with dimensions not exceeding 20'.
F. Screen toppings level, maintaining surface flatness of maximum 1:1000.

3.6 CONCRETE FINISHING

A. Provide formed concrete surfaces with exposed, concrete walls, columns, beams, joists, with smooth rubbed finish.
B. Finish concrete floor surfaces in accordance with ACI 301.
C. Wood-float the surfaces that receive quarry tile, ceramic tile, and terrazzo with full bed setting system.
D. Steel trowel surfaces that receive carpeting, resilient flooring, seamless flooring, thin-set quarry tile, and thin set ceramic tile.
E. Steel trowel surfaces scheduled to be exposed.
F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal.

3.7 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
C. Cure floor surfaces in accordance with ACI 308.
D. Ponding: Maintain 100% coverage of water over floor slab areas continuously for 4 days.
E. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

3.8 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services
B. Provide free access to Work and cooperate with appointed firm.
C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
D. The Owner may perform tests of cement and aggregates to ensure conformance with specified requirements.

E. Take three concrete test cylinders for every 150 cu yards or less of each class of concrete placed.
F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
G. Take one slump test for each set of test cylinders taken.

3.9 PATCHING

A. Contractor shall allow A/E to inspect concrete surfaces immediately upon removal of forms.
B. Excessive honeycomb or embedded debris in concrete is not acceptable; notify A/E upon discovery.
C. Patch imperfections in accordance with ACI 301.

3.10 DEFECTIVE CONCRETE

A. Defective concrete is concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
B. A/E shall determine the repair or replacement of defective concrete.
C. Do not patch, fill, touch-up, repair or replace-exposed concrete except upon express direction of A/E for each individual area.

END OF SECTION

SECTION 03 35 00
CONCRETE FLOOR FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Finishing separate floor toppings, slabs-on-grade, and monolithic floor slab.
- B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

1.2 REFERENCES
- A. ACI 301 - Structural Concrete for Buildings
- B. ACI 302 - Guide for Concrete Floor and Slab Construction
- C. ASTM E1155 - Standard Test Method for Determining F_F Flatness and F_L Floor Levelness Numbers

1.3 SUBMITTALS
- A. Submit under provisions of Section 01 33 00 Submittals Procedures.
- B. Product Data: Provide data on concrete hardener, sealer, and slip resistant treatment, compatibilities, and limitations.

1.4 MAINTENANCE DATA
- A. Submit under provisions of Section 01 77 00 Contract Closeout.
- B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

1.5 QUALITY ASSURANCE
- A. Perform work in accordance with ACI 301 and ACI 302.
- B. Maintain copies of each document on site.

1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, protect, and handle products under provisions of Section 01 31 00 Project Management and Coordination.
- B. Deliver materials in manufacturer's packaging including application instructions.

1.7 ENVIRONMENTAL REQUIREMENTS
- A. Temporary Lighting: Provide minimum 200 W light source, 8' above the floor surface, for each 425 sq. ft. of floor being finished.
- B. Temporary Heat: Ambient temperature of 50° F (10° C) minimum
- C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.8 COORDINATION
- A. Coordinate work under provisions of Section 01 31 00 Project Management and Coordination.
- B. Coordinate the work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 COMPOUNDS - HARDENERS AND SEALERS
- A. Non-Metallic Hardener: Premixed, dry powder, colored, emery aggregate and abrasion resistant hardener.

2.2 SLIP RESISTANT TREATMENT
- A. Slip Resistant Finish: Aluminum oxide type, color as selected from manufacturer's standard range

PART 3 EXECUTION

3.1 EXAMINATION
- A. Verify site conditions under provisions of Section 01 31 00 Project Management and Coordination.
- B. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
B. Wood-float surfaces that will receive quarry tile, ceramic tile, cementitious terrazzo with full bed setting system.
C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set quarry tile, and thin set ceramic tile.
D. Steel trowel surfaces scheduled to be exposed.
E. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on drawings.

3.3 FLOOR SURFACE TREATMENT

A. Apply dry shake liquid hardener in accordance with manufacturer's instructions as scheduled.
B. Apply slip resistant finish in accordance with manufacturer's instructions as scheduled.
C. Apply sealer in accordance with manufacturer's instructions as scheduled.

3.4 TOLERANCES

A. Measure for F_F and F_L tolerances for floors in accordance with ASTM E1155, within 72 hours after slab installation
B. Finish concrete to achieve the following tolerances:
    1. Under Ceramic or Quarry Tile on Setting Bed: F_F 25 and F_L 25
    2. Under Resilient flooring (VCT, sheet vinyl, etc): F_F 30 and F_L 25
    3. Exposed to View and Foot Traffic (polished concrete): F_F 40 and F_L 35
    4. Exposed stained concrete (mechanical, electrical, custodial): F_F 20 and F_L 15
    5. Exception: The F_L levelness tolerances do not apply to any un-shored elevated construction.
    6. Correct the slab surface if the actual F_F or F_L number for the floor installation measures less than required.
C. Identify areas requiring corrective work.
    1. Correct all defects in the defined traffic floor by grinding or removal and replacement of the defective work.
    2. Re-measure corrected areas by the same process.

END OF SECTION

SECTION 03 36 00
POLISHED CONCRETE FLOOR

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Finishing separate floor toppings, slabs-on-grade, and monolithic floor slab.
B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.
C. Polished concrete finish for interior flatwork; polish concrete finishes for precast, vertical cast-in-place, and exterior concrete are specified in the sections for those types.
   1. All labor, materials, equipment, and services necessary for the grinding and polishing of concrete floors.
   2. Densifying impregnator/sealer and polishing to specified sheen level and aggregate exposure.
   3. Concrete must be cured a minimum of 28-days prior to polishing.

1.2 REFERENCES

A. ACI 301 - Structural Concrete for Buildings
B. ACI 302 - Guide for Concrete Floor and Slab Construction
C. ASTM C33/C33M, Standard Specification for Concrete Aggregates
D. ASTM C150/C150M, Standard Specification for Portland Cement
E. ASTM C779/C779M, Standard Test Method for Abrasion of Horizontal Concrete Surfaces
F. ASTM C805/C805M, Standard Test Method for Rebound Number of Hardened Concrete
G. ASTM C1028, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other like Surfaces by the Horizontal Dynamometer Pull Meter Method
H. ASTM D3960, Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
I. ASTM E1155 - Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers
J. ASTM E2129, Standard Practice for Data Collection for Sustainability Assessment of Building Products
K. ASTM G23, Standard Practice for Operating Light Exposure Apparatus (Carbon Arc Type) With and Without Water for Exposure of Nonmetalic Materials

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittals Procedures.
   1. Product Data: Provide data on concrete hardener, sealer, and slip resistant treatment, each grinding machine, including all types of grinding heads, dust extraction system, joint filler, concrete densifying impregnator, penetrating sealer, and any other chemicals used in the process, along with compatibilities, and limitations.
   2. VOC Data: Submit Green Seal Certification to GS-11 and description of basis for certification.
   3. Environmental Date: Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under the work of this section.
   4. Submit Applicators qualifications data.
   5. Submit polished concrete samples: Three samples 12" x 12" for each type of polished concrete finish required.

1.4 MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00 Contract Closeout.
B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

C. Provide maintenance procedures using manufacturer's recommended systems.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301 and ACI 302.
B. Maintain copies of each document on site.
C. VOC Content; Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.
D. Work inspected by Certified Applicator;
   1. Concrete finish equipment and chemical manufacturer shall certify installer/applicator.
   2. Contractor shall provide adequate number of skilled workers thoroughly trained and experienced in the necessary craft.
E. Pre Installation Conference: Conduct conference at site prior to start of work complying with the requirements of section 01 40 00.
F. Manufacturers Certification: Provide certification letter from both the equipment and chemical manufacturer stating the installer is a certified applicator and is familiar with proper procedures and installation requirements required by the manufacturer.
G. Mock-Ups;
   1. General Contractor to notify applicator at least 7-days prior to the pour schedule of mock-up.
   2. Reserve 100 SF for each color and finish at a location adjacent to floor receiving polish at concrete floor area able to be removed, patched, or placed in location where applied any variation in floor substrate will be corrected prior to being, with another flooring material. Place mock-up floor on the same day and same pour as the floors to receive polish.
   3. Install mock-ups to verify selections made under the sample submitted and to demonstrate methods and workmanship proposed for the project.
   4. If stand-alone mock-up is required, form shall be clean and free from extraneous substance and be at least 12" x 12" with a level plywood bottom on level ground with unobstructed access on all four sides.
   5. Test aggregate to ensure it will accept polish.
   6. Include control joints in the mock-up, contractor may saw as soon as the surface is firm enough not to displace any aggregate.
   7. Also, include edge conditions in the mock-up.
   8. Approved mock-ups may become part of the completed work if accepted by the owner.
H. Protection: General Contractor shall protect areas receiving polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water, and any other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall start immediately after the concrete slab is poured:
   1. All hydraulic powered equipment shall be diapered to avoid staining of concrete.
   2. Prohibit all vehicle parking or traffic on finished slab receiving polished finish, if vehicle traffic is necessary; provide drop clothes under the vehicles.
   3. Do not use pipe-cutting machines on the slabs receiving polished finish.
   4. Do not place steel on the slabs receiving polished finish.
   5. Keep all acids and acidic detergents form the slabs receiving polished finish.
   6. Painters shall use drop cloths on the slabs receiving polished finish, and if paint does get on the slab, remove the paint immediately.
   7. Inform all trades and workers of the slabs requiring protection at all times.
I. Environmental Limitations:
   1. Comply with the manufactures written instructions for substrate temperature, moisture

content, ambient temperature & humidity, ventilation, and other conditions affecting chemical performance.

2. Provide the proper flatness and levelness of the finished concrete slab.
   a. Floor flatness – minimum rating of 40
   b. Floor levelness – minimum rating of 30
   c. Cure time – minimum of 28-days
3. Application of finish system shall take place a minimum of 21-days prior to fixture and trim installation or substantial completion.
4. Close the finish concrete floor area to all traffic during the finish floor application and after application for time as recommended by the manufacturer.

J. Concrete Mix Design:
   1. Concrete mixture shall be at least 3500 PSI, non air-entrained.
      a. Keep any admixtures, plasticizers, slag, fly ash, or anything taking the place of Portland-based cement to a minimum.
      b. Use Portland cement Type I, conforming to ASTM C150/C150M.
      c. Keep concrete as cool and moist as possible, with concrete temperature below 85°F to help control cracking.
      d. Wet cures are most desirable, but if not possible use a penetrating, dissipating, or wax based cure and seal, as recommended by manufacturer.
      e. Do not use a denisifier/hardener material due to grinding of the floor after 6 days.
      f. The Architect/Engineer shall determine the saw cut patterns, colors, and layout.
      g. Color loads for integral color shall not be smaller than 3 cubic yards.
      h. Use one source for cement, aggregate, and pozzolan throughout the job.
         i) Monitor and control incoming material consistency.
         ii) Do not use calcium chloride based admixtures.
         iii) May use non-chloride admixture with the Architect's approval.
      i. Wash out all drums before loading, keep slumps consistent (maximum of 4), and minimize driver added water maintaining a 0.45 water content ratio.
      j. Place concrete to achieve as true and smooth surface as possible.
         i) Mounds or dips are not acceptable.
         ii) Contractor shall control overall flatness and levelness, including on sloping areas within the permitted tolerances allowed by the specification and ASTM E1155.
      k. Protect the slab from indentions and footprints during the pour and the curing.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Deliver, store, protect, and handle products under provisions of Section 01 31 00 Project Management and Coordination.
   B. Deliver materials in manufacturer's packaging including application instructions.

1.7 ENVIRONMENTAL REQUIREMENTS
   A. Temporary Lighting: Provide minimum 200 W light source, 8' above the floor surface, for each 425 sq. ft. of floor being finished.
   B. Temporary Heat: Ambient temperature of 50° F (10° C) minimum
   C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.8 COORDINATION
   A. Coordinate work under provisions of Section 01 31 00 Project Management and Coordination.
   B. Coordinate the work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 COMPOUNDS - HARDENERS AND SEALERS

A. Non-Metallic Hardener: Premixed, dry powder, colored, emery aggregate and abrasion resistant hardener.

2.2 SLIP RESISTANT TREATMENT

A. Slip Resistant Finish: Aluminum oxide type, color as selected from manufacturer's standard range

2.3 POLISHING MATERIALS

A. Three-phase 480 Volt generator and step down transformer.

B. 3-head or 4-head counter rotating variable grinder equal to HTC Superfloor™ approved floor grinder with at least 600 pounds down pressure (Example: HTC 950RX, HTC 800HDX, HTC 800HD, HTC 650HDX, or etc.)

C. Use a dust extraction system, pre-separator, and squeegee attachments in compliance with project IAQ Management Plan.

1. HTC Superfloor™ Dust extraction system, pre-separator, and squeegee attachments with minimum flow rate of 322 cubic feet per minute such as a HTC 75D.

D. Grinding Head:

1. Metal bonded 16, 25, 40, 80, 150, and/or 300 grits.
2. Bonded phenolic diamonds 100, 200, 400, 800, 1500, and 3000 grits

E. Grinding Pads for Edges

1. 40, 60, and 120 grits
2. 100, 200, 400, 800, 1500, and 3000 grits

F. Hand grinder with dust extraction attachment and pads.

G. Penetrating liquid sealer hardener densifying impregnator or as specified by construction manager with the following performance criteria:

1. Chemical reactive, waterborne solution of inorganic silicate or siliconate materials and propriety components, odorless and colorless, which hardens and densifies concrete surfaces to protect against abrasion, dusting, and absorption of liquids.

H. Control joint and saw cut filler, two part filler or polyurea as specified by construction manager and approved by architect.

I. A ready to use penetrating dye or reactive stain that chemically combines with cured concrete to produce permanent variegated or translucent color effects or a hydrolyzed, or a lithium quartz or siliceous materials to create a translucent oe marbled color effect.

J. Graphic design with water based color dye used based on final design and color selection by the Architect.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00 Project Management and Coordination.

B. Verify that floor surfaces are acceptable to receive the work of this section.

1. Installer shall examine and approve concrete substrate for conditions affecting performance of the finished polished concrete slab.
2. General Contractor shall correct any conditions found not in compliance with this section.
3. Architect shall approve the repairs based on the requirements of this section.
4. Provide floor clean of materials and debris.
5. Protect adjacent surfaces as necessary to prevent damage by concrete polishing procedure.

3.2 CONCRETE FLOOR POLISHING

A. Basis of Design is the HTC Superfloor™ system, any other system used shall be pre-approved by the architect.
B. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
C. In areas with floor drains, maintain design floor elevation at walls, slope surfaces uniformly to drains as indicated on plans.
D. See plans for locations and type of specialized floor finish, color, and treatment in accordance with the design intent; contractor shall coordinate with architect all field samples and installations.
E. Grind the concrete floor within 2-3 inches of wall with 16, 25, 40, and 80 grit removing construction debris, floor slab imperfections until there is a uniform scratch pattern, and achievement of the desired concrete aggregate exposure.
    1. Vacuum the floor thoroughly using a squeegee vacuum attachment.
F. Apply material approved by the architect for color effects in accordance with the architect's plans, accepted mock-up, and the manufacturers recommended guidelines.
G. Fill construction joints and cracks with filler products as specified in the manufacturer's instructions colored to match (or contrast) with the concrete color specified by the architect.
H. Apply densifying impregnator per the manufacturer's recommendations.
    1. Cover the entire work area liberally and allow setting as required by manufacturer.
    2. Apply again to areas where the densifying impregnator has soaked in and allow setting.
    3. Squeegee excess material off the floor.
    4. Allow 12 to 24 hours for curing, as required by the manufacturer.
I. Grind the floor to within 2-3 inches of walls with metal bonded diamond grits of 150 and 300, grinding 90° from each previous grind and removing all the scratches from the previous grit.
    1. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.
J. Grind the edges with 40, 60, and 120 grit grinding pads, removing all scratches from the previous grit.
    1. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.
K. Polish the floor to the desired sheen level with phenolic resin bonded diamond grits of 100, 200, 400, 800, 1500, and 3000, first polishing the edges (if specified) with pads of the same grit, then the field of the floor, removing all scratches from the previous grit.
    1. After each polish, clean the floor thoroughly using clean water and an auto scrubber or a mop and wet vacuum.
L. Apply HTC Superfloor™ Stainguard, buff with Green 300 grit twister pad as necessary.
M. Upon completion, the work shall be ready for final inspection and acceptance by the architect and owner.

3.3 SHEEN

A. Polished Concrete Level 1:
    1. At a distance of 100', the floor will reflect images from side lighting.
B. Polished Concrete Level 2:
    1. At a distance of 30' to 50', the floor will clearly reflect from side and overhead lighting.

3.4 EXPOSED AGGREATE

A. Exposure rate per architect and owner selection based on approved mock-up.

3.5 EDGES

A. Polish all edges to match the field finish area.

3.6 PROTECTION

A. Protect the floors from damage as required.

3.7 TOLERANCES

A. Measure for F_F and F_L tolerances for floors in accordance with ASTM E1155, within 72 hours after slab installation

B. Finish concrete to achieve the following tolerances:
   1. Exposed to View and Foot Traffic (polished concrete): F_F 40 and F_L 35
   2. Exposed stained concrete (mechanical, electrical, custodial): F_F 20 and F_L 15
   3. Exception: The F_L levelness tolerances do not apply to any un-shored elevated construction.
   4. Correct the slab surface if the actual F_F or F_L number for the floor installation measures less than required.

C. Identify areas requiring corrective work.
   1. Correct all defects in the defined traffic floor by grinding or removal and replacement of the defective work.
   2. Re-measure corrected areas by the same process.

3.8 SITE ENVIRONMRNTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation as necessary and recommended by the manufacturer to meet the project IAQ requirements.

B. Waste Management:
   1. Coordinate with manufacturer for take-back program.
   2. Set aside scrap to be returned to manufacturer for recycling into new product.
   3. Close and seal all partially used containers of paint maintaining quality necessary for reuse.

END OF SECTION

SECTION 03 41 00
STRUCTURAL PRECAST CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Columns and bearing saddles
- B. Beams, spandrels, girders, purlins
- C. Floor of single, double, quad tees; channel slabs or inverted tee beam
- D. Grout packing.
- E. Connection and supporting devices
- F. Lintels and bond beams.
- G. Piles

1.2 REFERENCES
- A. ACI 301 - Structural Concrete for Buildings
- B. ACI 318 - Building Code Requirements for Structural Concrete
- C. ASCE-7 – Minimum Design Loads for Building & Other Structures
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- F. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
- G. ASTM A416/A416M – Standard Specification for Steel Strand, Uncoated Seven-Wire (Stress-Relieved) for Pre-stressed Concrete
- H. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
- I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- J. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel, Sheet, Strip, Plate and Flat Bar
- K. ASTM C150/C150M - Standard Specification for Portland Cement
- L. AWS D1.1/D1.1M - Structural Welding Code Bundled Set B
- M. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel
- N. PCI MNL-116 - Manual for Quality Control for Plants and Production of Pre-cast Concrete Products
- O. PCI MNL-120 – PCI Design Handbook – Precast and Prestressed Concrete
- P. PCI MNL-123 - Design & Typical Details of Connections for Precast & Prestressed Concrete
- Q. PCI MNL-124 - Design for Fire Resistance of Precast Concrete
- R. FBC - Florida Building Code
- S. UL - Underwriter's Laboratories

1.3 DESIGN REQUIREMENTS
- A. Size the components to withstand design loads.
- B. Maximum Allowable Deflection: In accordance with FBC and ACI 318
- C. Design members exposed to the weather to provide for movement of components without damage, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal or cyclic day/night temperature ranges.
- D. Design system to accommodate construction tolerances, deflection of other building structural

members and clearances of intended openings.

E. Calculate structural properties of framing members in accordance with FBC, and ACI 318.
F. Design and construction shall comply with FBC, ASCE 7-Wind Loads.
G. Superimposed design dead loads on roofs shall be the actual dead loads of the system, roofing, MEP allowance, plus 5-psf for re-roofing.

1.4 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures
B. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, connection details, support items, dimensions, openings and relationship to adjacent materials, and sealed by a Professional Structural Engineer licensed in the State of Florida. Indicate design loads, deflections, cambers, bearing requirements and special conditions.
C. Product Data: Indicate standard component configurations, design loads, deflections, cambers and bearing requirements.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals Procedures
B. Design Data: Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing.
C. Provide a visual record of surrounding structures outside of school property at construction projects requiring driven piles.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with the requirements of PCI MNL-116, PCI MNL-123, and PCI MNL-120.
B. Fabricator: Company specializing in manufacturing the work of this section with minimum five years documented experience.
C. Erector: Company specializing in erecting the work of this section with three years documented experience and approved by manufacturer.
D. Design pre-cast concrete members under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.
E. Welder: Person qualified within previous 12 months in accordance with AWS D1.1 and AWS D1.4.

1.7 REGULATORY REQUIREMENTS

A. Conform to ACI 318 and applicable code for design load and construction requirements applicable to work of this section.
B. Conform to UL Assembly to achieve hour fire rating for floor or roof assembly.

1.8 PRE-INSTALLATION MEETING

A. Convene a pre-installation conference two weeks prior to commencing work of this section, under provisions of Section 01 31 00.
B. Instruct others when field cutting of required openings are 10: and smaller.

1.9 DELIVERY, STORAGE AND PROTECTION

A. Section 01 60 00 - Material Equipment and approved equals
B. Handle pre-cast members in position consistent with their shape, design, and Engineer's requirements.
    1. Lift and support only from support points.
C. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.

D. Protect members to prevent staining, chipping or spalling of concrete.
E. Mark each member with date of production and final position in structure.

1.10 PROJECT CONDITIONS
A. Section 01 31 00 - Coordination and Meetings
B. Coordinate the work of framing components not pre-tensioned but associated with the work of this section.

PART 2 PRODUCTS

2.1 MATERIALS
A. Cement: White or Gray Portland, conforming to ASTM C150/C150M Type I or III.
B. Aggregate, Sand, Water, and Admixtures, Pre-cast Fabricator determined as appropriate to design requirements and PCI MNL-116.

2.2 REINFORCEMENT
A. Tensioning Steel Tendons: ASTM A416/A416M Grade 250K or 270K, of sufficient strength commensurate with member design
B. Reinforcing Steel: ASTM A615/A615M Grade 60 deformed steel bars.
C. Welded Steel Wire Fabric: ASTM A185/A185M Plain Type, ASTM A497/A497M Welded Deformed Type, and ASTM A497/A497 Deformed Type in flat sheets galvanized.
D. Coating: Galvanize reinforcement to resist corrosion.

2.3 ACCESSORIES
A. Connecting and Supporting Devices:
1. ASTM A36/A36M carbon steel plates, angles, items cast into concrete inserts, hot-dip galvanized in accordance with ASTM A153/A153M.
2. Do not paint surfaces in contact with concrete or surfaces requiring field welding.
B. Grout: Non-shrink, non-metallic, non-ferrous minimum yield strength of 10,000 psi at 28 days.
C. Bearing Pads: High-density plastic, smooth both sides, Vulcanized elastomeric compound molded to size, Neoprene.
D. Bolts, Nuts and Washers: High strength steel type recommended for structural steel joints.
E. Prime Paint: Zinc rich alkyd type.

2.4 FABRICATION
A. Fabrication procedure to conform to PCI MNL-116
B. Maintain plant records and quality control program during production of pre-cast members and make records available upon request.
C. Ensure reinforcing steel, anchors, inserts, plates, angles and other cast-in items are embedded in the locations as shown on shop drawings.
D. Tension reinforcement tendons as required to achieve design load criteria.
E. Provide required openings with a dimension larger than 10-inches and embed accessories provided by other sections, at indicated locations.
F. Exposed Ends at Stressing Tendons: Fill recess with [non-shrink] [epoxy] grout, trowel flush.

2.5 FINISHES
A. Ensure exposed-to-view finish surfaces of pre-cast concrete members are uniform in color and appearance.
B. Cure members under identical conditions to develop required concrete quality, and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
C. Rubbed Finish: Surface holes or bubbles over 1/4 inch filled with matching cementitious paste, fins or protrusions removed and surface ground smooth, surface then rubbed with neat

cementitious paste to smooth and even color and texture.

2.6 FABRICATION TOLERANCES
- A. Conform to PCI MNL-116.

2.7 SOURCE QUALITY CONTROL AND TESTS
- A. Section 01 40 00 - Quality Control: Provide mix design for concrete.
- B. Test samples in accordance with applicable ASTM standard.

PART 3 EXECUTION

3.1 APPLICATION
- A. Verify that site conditions are ready to receive work and field measurements are as shown on shop drawings.

3.2 PREPARATION
- A. Prepare support equipment for the erection procedure, temporary bracing, and induced loads during erection.

3.3 ERECTION
- A. Erect members without damage to structural capacity, shape, or finish.
  1. Replace or repair damaged members.
- B. Align and maintain uniform horizontal and vertical joints, as erection progresses.
- C. Protect members from staining by maintaining temporary bracing until final placement of all supports.
- D. Provide temporary lateral support to prevent bowing, twisting, or warping of members.
- E. Adjust differential camber between precast members to tolerance before final attachment.
- F. Install bearing pads.
- G. Level differential elevation of adjoining horizontal members with grout to maximum slope of 1:12
- H. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers.
- I. Grout underside of column and beam bearing plates and joints between members at roof and floor locations.
- J. Secure units in place and perform welding in accordance with AWS D1.1.

3.4 ERECTION TOLERANCES
- A. Section 01 40 00 - Quality Control: Tolerances
- B. Erect all members' level and plumb within allowable tolerances.
- C. Conform to PCI MNL-116.
- D. When members cannot be adjusted to conform to design or tolerance criteria, cease work and advise Architect/Engineer.
  1. Execute modifications as directed.

3.5 PROTECTION
- A. Protect members from damage caused by field welding or erection operations.
- B. Provide non-combustible shields during welding operations.

3.6 CLEANING
- A. Clean weld marks, dirt or blemishes from surface of exposed members.

END OF SECTION

SECTION 03 52 16
LIGHTWEIGHT INSULATING CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Insulating concrete fill over structural roof decking
- B. Perimeter joint filler

1.2 REFERENCES
- A. ASTM A185/A185M - Standard Specification for Steel Welded Wire, Reinforcement, Plain for Concrete
- B. ASTM C138/C138M – Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- C. ASTM C150/C150M - Standard Specification for Portland Cement
- D. ASTM C260/C260M - Standard Specification for Air Entraining Admixtures for Concrete
- E. ASTM C332 - Standard Specification for Lightweight Aggregates for Insulating Concrete.
- F. ASTM C495/C495M – Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
- G. FBC - Florida Building Code

1.3 PERFORMANCE REQUIREMENTS
- A. Minimum Thermal Resistance of Installed Fill: Refer to plans and energy form for required R-value.

1.4 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate layout of slopes, drain locations, and interruptions.
- C. Product Data: Provide physical characteristics, thermal values, and product limitations.
- D. Certificates: Certify that products meet or exceed specified requirements and achieves the required density, thermal value and performance.
- E. Manufacturer's Installation Instructions: Indicate mix instructions.

1.5 QUALITY ASSURANCE
- A. Installer: Company specializing in placing lightweight concrete fill-material specified in this section with minimum three years documented experience and licensed by manufacturer.
- B. Thermal Resistance Values: Use values base the thermal conductivity of insulating concrete in accordance with ASTM specifications at 40°F mean temperature.
- C. Wind Uplift Resistance: Use a deck system tested approved and listed in Factory Mutual System Approval Guide for FM Class rating matching the required uplift loads of the structural plans.
- D. Certification: Upon completion of roof deck, supply the Owner through the Architect the Manufacturer’s certificate certifying the concrete is per manufacturer's requirements by certified installer.

1.6 REGULATORY REQUIREMENTS
- A. Conform to applicable code for combustibility requirements.

1.7 WARRANTY
- A. Provide Owner with a no-dollar limit insulating concrete warranty for a minimum of 10-years, signed by the manufacturer stating:
  1. Insulating concrete system shall retain a minimum of 80% of designed thermal resistance for the warranty period.

2. Warranty shall include the composite roof deck system - both the concrete and insulation board.
3. Insulating concrete system shall remain re-roofable for the warranty period.
4. Warranty shall not limit by geographic location the Owner's right for claims, actions, or proceedings.
5. Insulating concrete shall remain in place when the roof membrane sustains wind damage.

1.8 PRE-INSTALLATION MEETING

A. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.
B. Convene two weeks prior to commencing work of this section.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Material Equipment and approved equals: Environmental conditions affecting products on site
B. Do not place fill at ambient temperatures below 40°F without heating mix water to 90-110°F.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cement: ASTM C150/C150M, Portland Type I Normal, gray color
B. Lightweight Aggregate: ASTM C332; Group I, perlite or vermiculite
C. Concrete Materials: Aggregate required by manufacturer and water
D. Air-Entrainment Agent: ASTM C260/C260M, type recommended by lightweight aggregate manufacturer

2.2 ACCESSORIES

A. Reinforcement: Hexagonal woven wire mesh, galvanized.
B. Perimeter Joint Filler: Glass fiber strips, compressible to 50% original thickness under load of 25 psi with full recovery
C. Vents: Type recommended by lightweight aggregate manufacturer
D. Insulation: Molded polystyrene with venting holes to 3% of board area

2.3 CONCRETE MIX

A. Provide cellular concrete mix to:

Compressive Strength	Wet Density	Oven Dry Density
350 psi Minimum	50 lb/cu ft Maximum	36 lb/cu ft Maximum

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 Project Management and Coordination: Verify existing conditions prior to beginning work.
B. Verify the grouting/taping of joints in roof members to prevent seepage of wet insulating concrete.

3.2 PREPARATION

A. Install one-inch thick expansion joint filler at:
1. Perimeter of roof decking
2. Around penetrations through deck
3. Every 100' of deck surface dimension
4. Each change of deck direction on metal roof deck surfaces

3.3 INSTALLATION

A. Slurry deck surface; place insulation; use mix to fill holes and breaks.

B. Place insulating concrete and screed surface to achieve minimum thickness.
C. Slope surface ¼"/foot minimum for roof surface drainage
D. Provide ½"/foot sloped crickets on the high side of roof equipment curb.

3.4 CURING

A. Cure in accordance with lightweight aggregate manufacturer's instructions.
B. Protect insulating concrete from excess evaporation of surface moisture.
C. During low humidity conditions, sprinkle water over concrete surface to aid hydration and curing.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control Field inspection and testing for dry density.
B. Testing Laboratory: Take three test samples from each 75 or less cu yds of insulating concrete placed.
C. Testing Laboratory: Take one additional test sample during cold weather concreting.

END OF SECTION

SECTION 04 05 13
MASONRY MORTAR AND GROUT

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Mortar for Masonry
- B. Grout for Unit Masonry

1.2 REFERENCES
- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures
- B. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures
- C. ASTM C91/C91M - Standard Specification for Masonry Cement
- D. ASTM C94/C94M- Standard Specification for Ready-Mixed Concrete
- E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar
- F. ASTM C150/C150M - Standard Specification for Portland Cement
- G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout
- J. ASTM C476 - Standard Specification for Grout for Masonry
- K. ASTM C595/C595M - Standard Specification for Blended Hydraulic Cement
- L. ASTM C780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
- M. ASTM C1019 – Standard Test Method of Sampling and Testing Grout
- N. FBC - Florida Building Code

1.3 SUBMITTALS
- A. Submit mix design for mortar indicating whether to use the proportion or the property specification of ASTM C270.
- B. Submit mix design for grout indication conformance of grout to requirements of ASTM C476.
- C. Submit test reports indicating conformance of mortar materials to property specifications of ASTM C270.
- D. Submit test reports of pre-construction tests of mortar for consistency, mortar aggregate ratio, water content, air content, compressive strength, and splitting tensile strength in conformance with ASTM C780.
- E. Submit test reports of grout tests in conformance to ASTM C1019.
- F. Submit manufacturer's certificate for products indicating conformance with specified requirements.
- G. Submit two samples representative of mortar color.

1.4 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store packaged materials in original unopened containers and store in dry weather-tight enclosures.
- B. Stockpile and handle aggregates to prevent segregation and contamination.
- C. Maintain sand for volume proportioning of mortar and grout in a damp loose condition.

1.5 ENVIRONMENTAL REQUIREMENTS
- A. Follow requirements of ACI530.1/ASCE6/TMS 602 for cold and hot weather construction.

PART 2 PRODUCTS

2.1 MORTAR MATERIALS
- A. Cementitious Materials:
  1. Masonry Cement: ASTM C91/C91M, Type M or S, gray color
  2. Portland Cement: ASTM C150/C150M, Type I, gray color

3. Hydrated Lime: ASTM C207, Type S

B. Sand: ASTM C144

C. Water: Provide water suitable for drinking, clean, and free of harmful amounts of acid, alkalis, salts, or organic materials.

D. Admixtures:

1. When required use only non-chloride based accelerators as approved by specifier.
2. Do not add antifreeze substances to the mortar.

E. Pigments: When required used mineral oxide pigments not to exceed 5% of the weight of masonry cement or 10% of the weight of Portland Cement in the mortar.

2.2 GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I

B. Hydrated Lime: ASTM C207, Type S

C. Aggregates: ASTM C404

D. Water: Provide water suitable for drinking, clean, and free of harmful amounts of acid, alkalis, salts, or organic materials.

2.3 MORTAR MIXES

A. Mortar: Provide ASTM C270, type 'M' or type 'S' in conformance with proportion specifications.

2.4 GROUT MIXES

A. Grout: ASTM C476, coarse grout meeting proportion requirements

2.5 MORTAR MIXING

A. Measure sand by volume or equivalent weight; do not measure by shovel.

B. In clean mortar mixer, mix ingredients for 3 to 5 minutes with maximum amount of water to produce proper workability.

C. Re-temper mortar as needed within 2½-hours after initial mixing.

D. Discard unused mortar 2½-hours after initial mixing.

2.6 GROUT MIXING

A. Control batching procedure to ensure proper volume proportions of grout materials and achieve grout slump between 8" and 11".

B. Mix grout in accordance with ASTM C94.

C. Measure grout materials mixed at job site by volume and mix all ingredients in mechanical mixer for minimum of five minutes.

2.7 MIX TESTS

A. Testing of Mortar: In accordance with ASTM C270

B. Testing of Grout: In accordance with ASTM C1019

PART 3 EXECUTION

3.1 INSTALLATION

A. Install mortar and grout in accordance with ACI 530.1/ASCE 6/TMS 602.

3.2 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Quality Control.

B. Test Mortar in accordance with ASTM C780 for consistency, mortar aggregate ratio, water content, air content, compressive strength, and splitting tensile strength.

C. Test Grout in accordance with ASTM C1019

END OF SECTION

SECTION 04 20 00
MASONRY UNITS

PART I GENERAL

1.1 SECTION INCLUDES
- A. Concrete masonry and brick
- B. Reinforcement, anchorage, and accessories

1.2 REFERENCES
- A. ASCE 7 – American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
- B. ACI 530/ASCE 5/TMS 402 – Building Code Requirements for Masonry Structures
- C. ACI 530.1 /ASCE 6/TMS 602 – Specifications for Masonry Structures
- D. ASTM A82/A82M – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- E. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
- F. ASTM A167- Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- G. ASTM A580/A580M – Standard Specification for Stainless and Heat-Resisting Steel Wire
- H. ASTM A615/A615M – Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
- I. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- J. ASTM A653/A653M – Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
- K. ASTM B370 - Standard Specification for Cooper Sheet and Strip for Building Construction
- L. ASTM C34 – Standard Specification for Structural Clay Load-Bearing Wall Tile
- M. ASTM C55 – Standard Specification for Concrete Building Brick
- N. ASTM C56 – Standard Specification for Structural Clay Non-Load Bearing Tile
- O. ASTM C62 – Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
- P. ASTM C73 – Standard Specification for Calcium Silicate Face Brick (Sand-Line Brick)
- Q. ASTM C90 - Standard Specification for Load-Bearing Concrete Masonry Units
- R. ASTM C126 – Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units
- S. ASTM C129 – Standard Specification for Non-Load Bearing Concrete Masonry Units
- T. ASTM C212 – Standard Specification for Structural Clay Facing Tile
- U. ASTM C216 – Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
- V. ASTM C315 – Standard Specification for Clay Flue Linings and Chimney Pots
- W. ASTM C530 – Standard Specification for Structural Clay Non-Load Bearing Screen Tile
- X. ASTM C652 – Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)
- Y. ASTM C744 – Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units
- Z. IMIAC – International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Units
- AA. IMIAC – International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction

BB. UL – Fire Resistance Directory
CC. FBC - Florida Building Code

1.3 SUBMITTALS
A. Submit under provision s of Section 01 33 00.
B. Product Data: Provide data for masonry units and fabricated wire reinforcement.
C. Samples: Submit four samples of decorative block, face brick, pre-faced, units to illustrate color, texture and extremes of color range.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.5 REGULATORY REQUIREMENTS
A. Design and construction shall comply with ASEC 7 Wind Loads, FBC, ACI 530/ASCE 5/TMS 402, and ACI 530.1/ASCE 6/TMS 602
B. Conform to applicable code for UL Assembly requirements for fire-rated masonry construction.
C. Provide lateral support for block walls, both vertical and horizontal.
1. The vertical heights of masonry between horizontal supports shall be in accordance with the wall lateral support requirements, FBC table 2107.1.

1.6 MOCK-UP
A. Provide mock-up of composite masonry under provisions of Section 01 40 00.
B. Construct a masonry wall into a panel sized 5' long by 4' high, which includes a corner, mortar, and accessories, structural backup, wall openings, flashings, wall insulation, air barrier, vapor barrier and parging.
C. Locate where directed.
D. Mock-up to remain intact and protected until the Punch List is completed or until Owner agrees in writing to removal.
E. Mock-up may remain as part of the work with the Owner's approval.

1.7 PRE-INSTALLATION CONFERENCE
A. Meet one week prior to commencing work of this section, under provisions of Section 01 31 00.

1.8 DELIVERY, STORAGE AND HANDLING
A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

1.9 ENVIRONMENTAL REQUIREMENTS
A. Cold Weather Requirements: IMIAC – Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
B. Hot Weather Requirements: IMIAC – Recommended Practices and Guide Specifications for Hot Weather Masonry Construction

1.10 COORDINATION
A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate the masonry work with installation of window anchors.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS
A. Load-Bearing Concrete Masonry Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
B. Hollow Non-Load Bearing Block Units (CMU): ASTM C129, Type II – Non-Moisture Controlled

C. Concrete Brick Units: ASTM C55, Grade N, Type II – Non-Moisture Controlled of same Type and Weight as block units
D. Provide special units for 90° corners, bond beams, lintels, coved bases, bull nosed corners and angle corners.
E. All block installed if fire-rated walls and partitions shall be classified units or certified for the intended use in accordance with FBC.

2.2 BRICK UNITS
A. Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
B. Building Brick: ASTM C62, Grade NW; solid units
C. Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
D. Sand-Lime Face Brick: ASTM C73, Grade SW
E. Size and Shape: Provide special units for 90° corners, lintels, bull nosed corners and angle corners.
F. Special Brick Shape: Shaped to profile indicated; surface texture on exposed sides and ends.
G. Giant Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
H. Giant Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
I. Provide special units for 90° corners, lintels, bull nosed corners and angle corners.
J. Special Giant Brick Shape: Shaped to profile indicated; surface texture on sides and ends.

2.3 REINFORCEMENT AND ANCHORAGE
A. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A641/A641M Class 3 after fabrication, 3/16" side rods with 9-gauge crossties
B. Multiple Wythe Joint Reinforcement: Ladder type; with moisture drip; adjustable type, steel wire, hot dip galvanized ASTM A641/A641M Class 3 fabrication, 3/16" side rods with 9-gauge crossties.
C. Reinforcing Steel: ASTM A615/A615M Grade 40 and 60, deformed carbon bars, unfinished
1. Strap Anchors: Bent steel shape, hot dip galvanized to ASTM A123/A123M, B2 finish.
D. Wall Ties: Corrugated formed sheet metal, gauge thick, adjustable, hot dip galvanized to ASTM A123/A123M B2 steel finish.
E. Wall Ties: Formed steel wire, gage thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A123/A123M B2 steel finish.
F. Dovetail Anchors: Bent steel strap, galvanized to ASTM A123/ASTM 123M B2 finish.

2.4 MORTAR AND GROUT
A. Mortar and Grout: As specified in Section 01 05 13.

2.5 FLASHINGS
A. Copper: ASTM B370/B370M, cold-rolled; 20 oz/sq ft, 0.027" thick; natural finish
B. Galvanized Steel: ASTM A653/A653M, G90 finish, 24-guage core steel
C. Stainless Steel: ASTM A167, Type 304, soft temper; 24-gauge thick; smooth finish
D. Provide dovetail, saw tooth, or other design to develop all direction bonding
E. Lap Sealant: Butyl type as specified in Section 07 92 00

2.6 ACCESSORIES
A. Performed Control Joints: Neoprene material with corner and tee accessories, cement fused joints
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50% to joint width; self-expanding.
C. Cavity Wall Drainage System: High-density polyethylene to support mortar droppings and debris within the cavity.
D. Building Paper: No. 30 asphalt saturated felt.

E. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.
F. Weep: Preformed plastic tubes, hollow
G. Cavity Vents: Molded polyvinyl chloride grilles, insect resistant.
H. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
B. Verify items provided by other sections of work are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION
A. Direct and coordinate placement of metal anchors supplied to other sections.
B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COURSING
A. Establish lines, levels, and coursing indicated.
1. Protect from displacement.
B. Maintain masonry courses to uniform dimension.
1. Provide vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
1. Coursing: One unit and one mortar joint to equal 8"
2. Mortar Joints: Concave
D. Brick Units:
1. Coursing: Three units and three mortar joints to equal 8"
2. Mortar Joints: Concave

3.4 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Do not butter corners of joints or excessively furrow mortar joints.
D. Remove excess mortar as work progresses.
E. Interlock intersections and external corners.
F. Do not shift or tap masonry units after mortar has achieved initial set.
1. To make an adjustment, remove mortar and replace.
G. To prevent broken masonry unit corners or edges perform jobsite cutting of masonry units with proper tools to provide straight, clean, un-chipped edges.
H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive or bitumen damp proofing is applied.
I. Isolate masonry partitions from vertical structural framing members with a control joint.
J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.5 WEEPS
A. Install weeps in veneer at intervals recommended by the Brick Institute of America.

3.6 CAVITY WALL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Provide a system of high-density polyethylene strands woven to a mesh to collect mortar dropping and permanently suspend them above the weeps.
B. Build inner wythe ahead of outer wythe to receive cavity insulation air/vapor barrier adhesive.

3.7 REINFORCEMENT AND ANCHORAGES – SINGLE WYTHE MASONRY
A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd joints above and below openings. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Reinforce stack-bonded unit, joint corners, and intersections with strap anchors 16" o.c.
F. All masonry below grade is to be grouted solid.
1. Provide footing/wall dowels.
2. Measure the splice length from the finish floor.

3.8 REINFORCEMENT AND ANCHORAGES – VENEER MASONRY
A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
1. Extend minimum 16" each side of opening.
C. Place joint reinforcement ends minimum 6".
D. Lap joint reinforcement ends minimum 6".
E. Embed wall ties in masonry back up for bonding veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
1. Place maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
F. Secure wall ties, rods, strap, anchors to back-up and embed into masonry veneer at maximum 16" o.c. vertically, and 36" o.c. horizontally.
G. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
H. Provide length to extend a minimum of 1½" into the exterior wythe.

3.9 REINFORCEMENT AND ANCHORAGES – CAVITY WALL MASONRY
A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
1. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Embed anchors in concrete or attached to structural steel members.
1. Embed anchorages in every second block or sixth brick joint.
2. Provide length to extend a minimum 1½" into the exterior wythe.
F. Reinforce stack bonded unit joint corners and intersection with strap anchors 16" o.c.

3.10 REINFORCEMENT AND ANCHORAGES – MULTIPLE WYTHE UNIT MASONRY
A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
1. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Support and secure reinforcing bars from displacement.
1. Maintain position within ½" of dimensioned position.
F. Embed anchors embedded in concrete or attach to structural steel members.

1. Embed anchorages in every second block or sixth brick joint.

G. Provide length to extend a minimum 1½" into the exterior wythe.

H. Reinforce stack bonded unit joint corners and intersection with strap anchors 16" o.c.

3.11 MASONRY FLASHINGS

A. Provide through wall flashing under parapet copings, for counter-flashing in masonry walls, where roofs abut, at lintels of exterior wall openings, ledge or shelf angles, under windowsills and band courses, at spandrel beams, foundation walls and where shown on drawings.

B. Turn flashing up minimum 8" and bed into mortar joint of masonry, seal to concrete, and seal to sheathing over framed back up.

C. Lap end joints minimum 6" and seal watertight.

D. Turn flashing, fold and seal at corners, bends and interruptions to form dams.

3.12 SILLS

A. See specification section 08 51 13 – 3.1 B Sill & Buck for windowsill requirements.

3.13 LINTELS

A. Install lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or pre-cast concrete lintels area not scheduled.

C. Openings up to 42" Wide: Place two, No. 4 reinforcing bars 1" from bottom web

D. Openings from 42": Up to 78" wide:

1. Place two, No. 5 reinforcing bars 1" from bottom web.

E. Opening over 78": Reinforce openings as detailed.

F. Do not splice reinforcing bars.

G. Support and secure reinforcing bars from displacement.

2. Maintain position within ½" of dimensioned position.

H. Place and consolidate grout fill without displacing reinforcing.

I. Allow masonry lintels to attain specified strength before removing temporary supports.

J. Maintain bearing on each side of opening. Minimum bearing of 4" on concrete, 3" on steel and 8" on masonry

3.14 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.

B. Place mortar in masonry unit bed-joints back ¼" from edge of unit grout spaces, bevel back and upward.

1. Permit mortar to cure seven days before placing grout.

C. Reinforce masonry unit cores and cavities with reinforcement bars and grout as indicated.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.

E. Grout space dimension is the clear dimension between any masonry protrusions and increases by diameters of the horizontal bars within the cross-section of the grout space.

F. Wet masonry unit surfaces in contact with grout just prior to grout placement.

G. The minimum grouted spaces in both horizontal dimensions shall be as follows:

1. Low-Lift Grouted Construction
   a. Fine aggregate: Grout spaces may be less than 2".
   b. Fine or coarse aggregate: Grout spaces shall be 2" or more.
2. High-Lift Grouted Construction:
   a. Fine or coarse aggregate: Grout space shall not be less than 2" wide.

H. The area of vertical reinforcement shall not exceed 6% of the area of the grout space.
I. When grouting is stopped for more than one hour, terminate grout 1½" below top of upper masonry unit to form a positive key for subsequent grout placement.
J. Low Lift Grouting – Place first lift of grout to a height of 16" and rod for grout consolidation.
    1. Place subsequent lifts in 8" increments and rod for grout consolidation
K. High Lift Grouting:
    1. Provide cleanout opening no less than 4" high at the bottom of each cell to be grouted by cutting one face shell of masonry unit,
    2. In double wythe walls, omit every second masonry unit in one of the wythes for clean out and cell inspection purposes.
    3. In double wythe walls, construct vertical grout barriers or dams between the masonry wythes, with masonry units every 25' maximum.
    4. Clean out masonry cells and cavities with high-pressure water spray before pouring or pumping grout.
        a. Allow the complete water drainage and use compressed air to remove debris.
    5. Contractor shall request inspection of the cells and cavities before concealing them.
        a. Allow three days advance notice of inspection.
    6. After cleaning and cell inspections, seal openings with masonry units.
    7. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
    8. Limit grout lift to 48" and rod for grout consolidation. Wait 30 to 60 minutes before placing next lift.

3.15 CONTROL AND EXPANSION JOINTS

A. Provide expansion joints and control joints to prevent uncontrolled stress cracks in the structure and according to the engineering's plans and standards.
B. Do not continue horizontal joint reinforcement through control and expansion joints.
C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
D. Size control joint in accordance with Section 07 92 00 for sealant performance.

3.16 BUILT-IN WORK

A. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
B. Install built-in items plumb and level.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints.
    1. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12" from framed openings.
D. Do not build in organic materials subject to deterioration.

3.17 TOLERANCES

A. Maximum Variation from Alignment of Columns: Pilasters: ¼"
B. Maximum Variation from Unit to Adjacent Unit: 1/32"
C. Maximum Variation from Plane of Wall: ¼" in 10' and ½" in 20' or more
D. Maximum Variation from Plumb: ¼" per story non-cumulative and ½" in two stories or more
E. Maximum Variation from Level Coursing: ⅛" in 3', ¼" in 10'; and ½" in 30'
F. Maximum Variation of Joint Thickness: ⅛" in 3'
G. Maximum Variation from Cross-Section Thickness of Walls: ¼"

3.18 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds.
   1. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.19 PARGING

A. Dampen masonry walls prior to parging.
B. Scarify each parging coat to ensure full bond to subsequent coat.
C. Parge masonry walls in two uniform coats of mortar to a total thickness of ¾" minimum.
D. Steel trowel surface smooth and flat with a maximum surface variation of ⅛" per foot.
E. Strike top edge of parging at 45°

3.20 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Quality Control.

3.21 CLEANING

A. Clean work under provisions of 01 77 00, and comply with ASTM, BIA, and ACI 530.
B. Remove excess mortar and mortar smears as work progresses.
   1. Mortar streaks and/or stains that cannot be removed by light cleaning shall be replaced.
   2. Do not use abrasives for rubbing or scraping off mortar stains.
C. Replace defective mortar and match adjacent work.
D. Clean soiled surfaces with cleaning solution.
   1. Use only cleaning products approved by the Architect and applied in direct conformance with the manufacturer’s instructions.
   2. DO NOT USE Muratic acid to clean masonry.
E. Use non-metallic tools in cleaning operations.

3.22 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.
B. Without damaging completed work, provide protective boards at exposed external corners, only at those corners subject to damage due to construction activities.

END OF SECTION

SECTION 04 20 10
REINFORCED MASONRY UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Concrete masonry or brick units
- B. Reinforcement, anchorage, and accessories
- C. Parged masonry surfaces

1.2 REFERENCES
- A. ACI 530/ASCE 5/TMS 402– Building Code Requirements for Masonry Structures
- B. ACI 530.1/ASCE 6/TMS 602- Specifications For Masonry Structures
- C. ASCE 7 - American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
- D. ASTM A82/A82M - Standard Specification for Steel Wire for Concrete Reinforcement
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
- F. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- G. ASTM A653/A653M - Standard Specifications for Steel Sheet, Zinc Coated, (Galvanized) or Zinc Iron Alloy (Galvannealed) by the Hot-Dip Process.
- H. ASTM A580/A580M - Standard Specification for Stainless and Heat-Resisting Steel Wire
- I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars For Concrete Reinforcement
- J. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- K. ASTM B370 - Standard Specification for Cooper Sheet and Strip For Building Construction
- L. ASTM C34 – Standard Specification for Structural Clay Load-Bearing Wall Tile
- M. ASTM C55 - Standard Specification for Concrete Building Brick
- N. ASTM C56 – Standard Specification for Structural Clay Non-Load Bearing Tile
- O. ASTM C62 – Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
- P. ASTM C73 – Standard Specification for Calcium Silicate Face Brick (Sand-Line Brick)
- Q. ASTM C90- Standard Specification for Load-Bearing Concrete Masonry Units
- R. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
- S. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
- T. FBC - Florida Building Code
- U. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction
- V. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction
- W. UL - Fire Resistance Directory

1.3 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate bars sizes, spacing, locations, reinforcement quantities, bending and cutting schedules, supporting and spacing devices for reinforcement and accessories.

C. Product Data: Provide data for brick and masonry units and fabricated wire reinforcement.
D. Samples: Submit samples of decorative block, brick units to illustrate color, texture, and extremes of color range.
E. Design Data: Indicate required mortar strength, masonry unit assembly strength in all planes with supportive test data.
F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE
A. Perform work in accordance with ACI 530 and ACI 530.1.
B. Maintain one copy of each document on site.

1.5 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.6 REGULATORY REQUIREMENTS
A. Design and construction shall comply with ASCE 7 – Wind loads, FBC, ACI 530/ASCE 5/TMS 402, and ACI 530.1/ASCE 6/TMS 602.
B. Conform to applicable code for UL Assembly requirements for fire rated masonry construction.
C. Provide lateral support for block walls, both vertical and horizontal.
1. The vertical heights of masonry between horizontal supports shall be in accordance with the wall lateral support requirements, FBC table 2107.1

1.7 MOCK-UP
A. Provide mock-up of composite masonry under provisions of Section 01 40 00.
B. Construct a masonry wall panel sized 8' long by 6' high, which includes mortar and accessories, backup, wall openings, flashings, wall insulation, air barrier, vapor barrier, and parging.
C. Locate where directed.
D. Mock-up to remain intact and protected until the Punch List is completed or until Owner agrees in writing to removal.
E. Mockup may not remain as part of the work.

1.8 PRE-INSTALLATION CONFERENCE
A. Meet two weeks prior to commencing work of this section, under provisions of Section 01 31 00.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Store, protect, and deliver products to site under provisions of Section 01 60 00.

1.10 ENVIRONMENTAL REQUIREMENTS
A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction

1.11 COORDINATION
A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate the masonry work with installation of window anchors.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS
A. Hollow Load Bearing Block Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
B. Load Bearing Concrete Masonry Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
C. Decorative Block Units (CMU): ASTM C90, Type II – Non-Moisture Controlled

D. Concrete Brick Units: ASTM C55, Grade N, Type II – Non-Moisture Controlled of same type and weight as block units
E. All block installed in fire rated walls and partitions shall be classified units or certified for the intended use in accordance with FBC.

2.2 BRICK UNITS
A. Face Brick: ASTM C216, Type FBS, Grade MW; color as selected.
B. Building Brick: ASTM C62, Grade NW; solid units
C. Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
D. Sand-Lime Face Brick: ASTM C73, Grade SW
E. Size and Shape: Provide special units for 90° corners, lintels, bull nosed corners and angle corners
F. Special Brick Shape: Shaped to profile indicated; surface texture on sides and ends
G. Giant Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
H. Giant Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
I. Provide special units for 90° corners, lintels, bull nosed corners and angle corners
J. Special Giant Brick Shape: Shaped to profile indicated; surface texture on sides and ends

2.3 REINFORCEMENT AND ANCHORAGE
A. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A641/A641M Class 3 after fabrication, 3/16" side rods with 9-ga cross ties.
B. Multiple Wythe Joint Reinforcement: Ladder type; with moisture drip; adjustable type, steel wire, hot dip galvanized ASTM A641/A641M Class 3 fabrication, 3/16" side rods with 9-gauge crossties.
C. Reinforcing Steel: A615/A615M, Grade 40 or Grade 60; deformed carbon bars as specified in Section 03 20 00, unfinished
    1. Strap Anchors: Bent steel shape, hot dip galvanized to ASTM A123/A123M B2 finish.
D. Wall Ties: Corrugated formed sheet metal, gauge thick, adjustable, hot dip galvanized to ASTM A123/A123M B2 steel finish.
E. Wall Ties: Formed steel wire, gage thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A123/A123M B2 steel finish.
F. Dovetail Anchors: Bent steel strap, galvanized to ASTM A123/A123M B2 finish.

2.4 MORTAR AND GROUT
A. Mortar and Grout: As specified in Section 04 05 13.

2.5 FLASHINGS
A. Copper: ASTM B370, cold rolled; 20 oz/sq ft, 0.027 inch thick; natural finish.
B. Galvanized Steel: ASTM A653/A653M, G90 finish, 24-ga core steel
C. Stainless Steel: ASTM A167, Type 304, soft temper; 24-ga thick; smooth finish.
D. Provide dovetail; saw tooth, or other design to develop all direction bonding.
E. Lap Sealant: Butyl type as specified in Section 07 92 00

2.6 ACCESSORIES
A. Preformed Control Joints: Neoprene material, provide with corner and tee accessories, cement fused joints.
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50% to joint width and self-expanding.
C. Cavity Wall Drainage System: High-density polyethylene to support mortar droppings and debris within the cavity.
D. Building Paper: No. 30 asphalt saturated felt.

E. Nailing Strips: Softwood, preservative treatment for moisture resistance, dovetail-shape, sized to masonry joints.
F. Weep: Preformed plastic tubes, hollow
G. Cavity Vents: Molded polyvinyl chloride grilles insect resistant.
H. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
B. Verify items provided by other sections of work are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION
A. Direct and coordinate placement of metal anchors supplied to other sections.
B. Provide temporary bracing during installation of masonry work.
1. Maintain in place until building structure provides permanent bracing.

3.3 COURSING
A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension, with vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
1. Coursing: One unit and one mortar joint to equal 8"
2. Mortar Joints: Concave
D. Brick Units:
1. Coursing: Three units and three mortar joints to equal 8"
2. Mortar Joints: Concave

3.4 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
D. Remove excess mortar as work progresses.
E. Interlock intersections and external corners.
F. Do not shift or tap masonry units after mortar has achieved initial set.
1. Where adjustments are made, remove mortar, and replace.
G. Perform job site cutting of masonry units with proper tools to provide straight, clean, un-chipped edges.
1. Prevent broken masonry unit corners or edges.
H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive is applied, or bitumen damp proofing is applied.
I. Isolate masonry partitions from vertical structural framing members with a control joint.
J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.5 WEEPS
A. Install weeps in veneer at intervals recommended by the Brick Institute of America.

3.6 REINFORCEMENT AND ANCHORAGES

A. Install horizontal joint reinforcement 16" oc.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Reinforce stack-bonded unit, joint corners, and intersections with strap anchors 16" oc.
F. All masonry below grade is to be grouted solid.
    1. Provide footing/wall dowels.
G. Measure the splice length from the finish floor

3.7 REINFORCEMENT AND ANCHORAGES - VENEER MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16 each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Embed wall ties in masonry back-up for bonding veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
    1. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
F. Secure wall ties, rods, strap, anchors to back-up and embed into masonry veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
    1. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
    2. Provide length to extend a minimum of 1½" into the exterior wythe.
G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.8 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Embed anchors in concrete or attached to structural steel members in every second block or sixth brick joint.
    1. Provide length to extend a minimum 1½" into the exterior wythe.
F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.9 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Support and secure reinforcing bars from displacement.
    1. Maintain position within ½" of dimensioned position.
F. Embed anchors embedded in concrete or attached to structural steel members.
    1. Embed anchorages in every second block or sixth brick joint.
    2. Provide length to extend a minimum 1½" into the exterior wythe.

G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.10 MASONRY FLASHINGS

A. Provide thru-wall flashing under parapet copings, for counter-flashing in masonry walls, where roofs abut, at lintels of exterior wall openings, ledge or shelf angles, under windowsills and band courses, at spandrel beams, foundation walls and where shown on drawings.
B. Turn flashing up minimum 8" and bed into mortar joint of masonry, seal to concrete, and seal to sheathing over framed back up.
C. Lap end joints minimum 6" and seal watertight.
D. Turn flashing, fold, and seal at corners, bends, and interruptions to form dams.

3.11 SILLS

A. See specification section 08 51 13 – 3.1 B Sill & Buck for windowsill requirements

3.12 LINTELS

A. Install pre-cast concrete lintels over openings.
B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
C. Openings Up to 42" wide: Place two, No. 4 reinforcing bars 1" from bottom
D. Openings From 42" Up to 78" wide: Place two, No. 5 reinforcing bars 1" from bottom.
E. Opening Over 78": Reinforce openings as detailed.
F. Do not splice reinforcing bars.
G. Support and secure reinforcing bars from displacement.
    1. Maintain position within ½" of dimensioned position.
H. Place and consolidate grout fill without displacing reinforcing.
I. Allow masonry lintels to attain specified strength before removing temporary supports.
J. Maintain bearing on each side of opening.
    1. Minimum bearing of 4" on concrete, 3" on steel and 8" on masonry

3.13 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
B. Place mortar in masonry unit bed joints back ¼" from edge of unit grout spaces, bevel back and upward.
    1. Permit mortar to cure seven days before placing grout.
C. Reinforce masonry unit cores and cavities with reinforcement bars and grout.
D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.
    1. Splice reinforcement in accordance with Section 03 20 00.
E. Wet masonry unit surfaces in contact with grout just prior to grout placement.
F. Grout spaces less than 2" in width with fine grout using low lift grouting techniques.
G. Grout spaces 2" or greater in width, use a course grout.
H. When grouting is suspended for more than one hour, terminate grout 1½" below top of upper masonry unit to form a positive key for subsequent grout placement.
I. Low Lift Grouting:
    1. Place first lift of grout to a height of 16" and rod for grout consolidation.
    2. Place subsequent lifts in 8" increments and rod for grout consolidation.
J. High Lift Grouting:
    1. Provide cleanout opening no less than 4" high at the bottom of each grouted cell by cutting one face shell of masonry unit.

2. In double wythe walls, omit every second masonry unit in one of the wythes for clean out and cell inspection purposes.
3. In double wythe walls, construct vertical grout barriers or dams between the masonry wythes, with masonry units every 30' maximum.
4. Clean out masonry cells and cavities with high-pressure water spray. Permit complete water drainage.
5. Contractor shall request inspection of the cells and cavities.
    a. Allow three days advance notice of inspection.
6. After cleaning and cell inspection, seal openings with masonry units.
7. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
8. Limit grout lift to 60" and rod for grout consolidation.
    a. Wait 30 to 60 minutes before placing next lift.

3.14 CONTROL AND EXPANSION JOINTS

A. Provide expansion joints and control joints to prevent uncontrolled stress cracks in the structure and according to the engineering's plans and standards.
B. Do not continue horizontal joint reinforcement through control and expansion joints.
C. Install preformed control joint device in continuous lengths.
    1. Seal butt and corner joints in accordance with manufacturer's instructions.
D. Size control joint in accordance with Section 07 92 00 for sealant performance.

3.15 BUILT-IN WORK

A. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
B. Install built-in items plumb and level.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints.
    1. Fill frame voids solid with grout.
    2. Fill adjacent masonry cores with grout minimum 12" from framed openings.
D. Do not build in organic materials subject to deterioration.

3.16 TOLERANCES

A. Maximum Variation From Alignment of Columns and Pilasters: ¼"
B. Maximum Variation From Unit to Adjacent Unit: 1/32"
C. Maximum Variation From Plane of Wall: ¼" in 10' and ½" in 20' or more
D. Maximum Variation From Plumb: ¼" per story non-cumulative, ½" in two stories or more
E. Maximum Variation From Level Coursing: ⅛" in 3' and ¼" in 10', ½" in 30'
F. Maximum Variation of Joint Thickness: ⅛" in 3'
G. Maximum Variation from Cross-Section Thickness of Walls: ¼"

3.17 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds.
    1. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 PARGING

A. Dampen masonry walls prior to parging.
B. Scarify each parging coat to ensure full bond to subsequent coat.
C. Parge masonry walls in two uniform coats of mortar to a total thickness of ¾" minimum.

D. Steel trowel surface smooth and flat with a maximum surface variation of ⅛" per foot.
E. Strike top edge of parging at 45°

3.19 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services.

3.20 CLEANING

A. Clean work under provisions of 01 77 00 and conform to ASTM, BIA, and ACI 530.
B. Remove excess mortar and mortar smears as work progresses.
    1. Replace material when mortar streaks and/or stains are not removable by light cleaning.
    2. Do not use Abrasives for rubbing or scraping off mortar stains
C. Replace defective mortar and match adjacent work.
D. Clean soiled surfaces with cleaning solution.
    1. Use only cleaning products approved by the Architect and applied in direct conformance with the manufacturer's instructions.
    2. DO NOT USE Muratic acid to clean masonry.
E. Use non-metallic tools in cleaning operations.

3.21 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.
B. Without damaging completed work, provide protective boards at exposed external corners that may be damaged by construction activities.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Shop fabricated ferrous metal items.
- B. Shop fabricated aluminum items.

1.2 REFERENCES
- A. AAMA 204 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
- B. AAMA 606.1 - Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum
- C. AAMA 607.1 - Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
- D. AAMA 608.1 - Voluntary Guide Specifications and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum
- E. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
- F. ANSI ASC A14.3 - American National Standard for Ladders - Fixed - Safety Requirements
- G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products
- J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- K. ASTM A283/A283M – Standard Specification for Low and Intermediate Tensile Carbon Steel Plates
- L. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
- M. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- N. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- O. ASTM B26B26M - Standard Specification for Aluminum-Alloy Sand Castings
- P. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings
- Q. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating
- R. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- S. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
- T. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod and Wire
- U. ASTM B221 - Standard Specification for Aluminum-and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
- V. AWS A2.4 - Standard Symbols for Welding, Brazing, Nondestructive Examination
- W. AWS D1.1/D1.1M - Structural Welding Code Bundled Set B
- X. FBC - Florida Building Code
- Y. SSPC - Steel Structure Painting Council - Steel Structures Painting Council

1.3 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size, and type of fasteners, and accessories.

1. Include erection drawings, elevations, and details.

C. Indicate welded connections using standard AWS A2.0 welding symbols.
1. Indicate net weld lengths.

1.4 QUALIFICATIONS

A. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

B. Welders' Certificates: Submit under provisions of Section 01 33 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12-months.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M

B. Steel Tubing: ASTM A500/A500M, Grade B

C. Plates: ASTM A283/A283M

D. Pipe: ASTM A53/A53M, Type E or S, Grade B, Schedule 40 minimum

E. Bolts, Nuts, and Washers: ASTM A325 or A307 galvanized to ASTM A153/A153M for galvanized components

F. Welding Materials: AWS D1.1; type required for welded materials

G. Ladders: ANSI A14.3

H. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide

I. Touch-Up Primer for Galvanized Surfaces: SSPC 20, Type I Inorganic zinc rich

2.2 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221, Alloy 6063, Temper T5

B. Sheet Aluminum: ASTM B209, Alloy, Temper

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210, Alloy 6063, Temper T6

D. Aluminum-Alloy Bars: ASTM B211, Alloy 6063, Temper T6

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M, Alloy

F. Aluminum-Alloy Die Castings: ASTM B85/B85M, Alloy

G. Bolts, Nuts and Washers: Stainless steel

H. Welding Materials: AWS D1.1/D1.1M; type required for welded materials

2.3 FABRICATION

A. Fit and shop assemble in largest practical sections for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface.
1. Make exposed joints butt tight, flush, and hairline.
2. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Provide flush countersunk screws or bolts unobtrusively located consistent with design of component except as noted otherwise

F. Supply components required for anchorage of fabrications.
1. Fabricate anchors and related components of same material and finish as fabrication, except as noted otherwise.

2.4 FABRICATION TOLERANCES

A. Square: 1/8" maximum difference in diagonal measurements.

B. Maximum Offset between Faces: 1/16"

C. Maximum Misalignment of Adjacent Members: 1/16"

D. Maximum Bow: 1/8" in 48"

E. Maximum Deviation from Plane: 1/16" in 48"

2.5 FINISHES - STEEL

A. Prepare surfaces to be primed in accordance with SSPC SP 2.
B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Do not prime surfaces in where field welding is required.
D. Prime paint items with one coat.
E. Structural Steel Members:
   1. Galvanize after fabrication to ASTM A123/A123M.
   2. Provide minimum 1.25 oz/sq ft galvanized coating.
F. Non-structural Items:
   1. Galvanize after fabrication to ASTM A123/A123M.
   2. Provide minimum 1.25 oz/sq ft galvanized coating.
G. Chrome Plating: ASTM B177/B177M, weight, nickel-chromium alloy, satin finish.

2.6 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Exterior, hard coat, two step anodized to clear color to 0.0007" thickness organic coating to color selected.
B. Interior Aluminum Surfaces: Interior, hard coat, two-step anodized to clear color to 0.0007" thickness organic coating to color selected.
C. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.
B. Supply required items for casting into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Field weld components indicated on shop drawings.
D. Perform field welding in accordance with AWS D1.1.
E. Obtain approval prior to site cutting or making adjustments not scheduled.
F. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete
G. Provide isolation coatings where dissimilar metals are in contact or where aluminum is in contact with concrete.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Plumb: ¼" per story, non-cumulative
B. Maximum Offset from True Alignment: ¼"
C. Maximum Out-of-Position: ¼"

END OF SECTION

SECTION 05 51 00
METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel stair frame of structural sections with closed risers.
B. Steel pan to receive concrete-fill stair treads and landings.
C. Integral balusters and aluminum hand railing.
D. Aluminum hand railing on walls.

1.2 REFERENCES

A. ANSI A202.1 - Metal Bar Grating Manual for Steel and Aluminum Gratings and Stair Treads.
B. ASCE 7 - American Society of Civil Engineers, Minimum Design Loads of Buildings and Other Structures
C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
D. ASTM A53/A53M - Standard Specification for Pipe, Black, and Hot-Dipped, Zinc-coated Welded and Seamless
E. ASTM A123/123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products
F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
G. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
H. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
I. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
K. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
L. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
M. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra High Strength
N. ASTM E935 – Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
O. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings
P. AWS A2.4 - Standard Symbols Welding, Brazing, Nondestructive Examination
Q. AWS D1.1/D1.1M - Structural Welding Code Steel Bundled Set B
R. NAAMM AMP 510 - Metal Stairs Manual
S. NAAMM MBG 531 - Metal Bar Grating Manual
T. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual

1.3 DESIGN REQUIREMENTS

A. Florida Building Code (FBC)

B. Design stair assembly in accordance with ASCE 7

1.4 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size, and type of fasteners, and accessories.
C. Indicate welded connections using standard AWS A2.4 welding symbols show net weld lengths.

1.5 QUALITY ASSURANCE

A. Prepare work in accordance with ASTM E985.
B. Prepare and submit signed & sealed Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.
C. Welders' Certificates: Submit under provisions of Section 01 33 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12-months.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Sections: ASTM A36/A36M
B. Steel Tubing: ASTM A500/A500M, Grade B
C. Plates: ASTM A283/A283M
D. Pipe: ASTM A53/A53M, Grade B Schedule 40
E. Sheet Steel: ASTM A653/A653M, Grade B Structural Quality with G90, 0.90 oz/sq ft galvanized coating
F. Bolts, Nuts, and Washers: ASTM A325 or A307 galvanized to ASTM A153/A153M for galvanized components
G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure
H. Welding Materials: AWS D1.1/D1.1M; type required for welded materials
I. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide
J. Touch-Up Primer for Galvanized Surfaces: SSPC 20 Type-I Inorganic zinc rich

2.2 COMPONENTS

A. Gratings: ANSI A202.1
B. Concrete for Treads and Landings: Portland Cement Type I, 3000 psi 28 day strength, with a 2" to 3" slump

2.3 FABRICATION - GENERAL

A. Fit and shop assemble components in largest practical sections for delivery to site.
B. Fabricate components with joints tightly fitted and secured.
C. Continuously seal jointed pieces by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface.
    1. Make exposed joints butt tight, flush, and hairline.
    2. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings shall be flush countersunk screws or bolts unobtrusively located consistent with design of component except as noted otherwise.
F. Supply components required for anchorage of fabrications of same material and finish as fabrication, except as noted otherwise.
G. Accurately form components required for anchorage of stairs, landings, and railings to each other and to building structure.

2.4 FABRICATION - PAN STAIRS AND LANDINGS
- A. Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.
- B. Prime paint components.

2.5 FABRICATION - UNIT STAIR TOWERS
- A. Fabricate self-supporting steel stair towers with formed treads and risers; steel channel stringers; landing platforms; sectioned for transport; corner structural support members designed to support full weight of complete stair tower plus design live load; with aluminum railings, newel posts, and balusters.
- B. Fabricate stair towers to height not exceeding 40' for transportation purposes; designed for stacking to height of building as a self-supporting structure.

2.6 FINISHES
- A. Prepare surfaces to be primed in accordance with SSPC SP 2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Do not prime surfaces where field welding is required.
- D. Prime paint items with one coat.
- E. Galvanized items to minimum 1.25-oz/sq ft zinc coating in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.1 EXAMINATION
- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION
- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be casted into concrete and embedded in masonry with setting templates.

3.3 INSTALLATION
- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components as indicated on shop drawings in accordance with AWS D1.1/D1.1M.
  1. Grind welds smooth and flush.
- E. Field bolt and weld to match shop bolting and welding.
  1. Conceal bolts and screws whenever possible.
  2. Where not concealed, use flush countersunk fastenings.
- F. Mechanically fasten joints butted tight, flush, and hairline.
- G. Obtain approval prior to site cutting or making adjustments not scheduled.
- H. After erection, clean and remove any rust before priming any field welds, abrasions, and surfaces not shop primed or galvanized.

3.4 ERECTION TOLERANCES
- A. Maximum Variation From Plumb: ¼" per story, non-cumulative
- B. Maximum Offset From True Alignment: ¼"
- C. Completed installations shall meet FBC tolerance requirements for rise and run.

END OF SECTION

SECTION 05 52 00
METAL RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Aluminum pipe handrails, balusters, and fittings

1.2 REFERENCES
- A. ACSE 7 – Minimum Design Loads of Buildings and Other Structures
- B. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
- C. ASTM B211 - Standard Specification for Aluminum and Aluminum and Aluminum Alloy Rolled or Cold Finished Bars, Rods, and Wire
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- E. ASTM B241/A241M - Standard Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube
- F. ASTM B483 - Standard Specification for Aluminum and Aluminum and Aluminum Alloy Drawn Tubes for General Purpose Applications
- G. ASTM E935 – Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
- H. ASTM E985 – Standard Specification for Permanent Metal Railing Systems and Rails for Buildings
- I. FBC - Florida Building Code

1.3 DESIGN REQUIREMENTS
- A. Railing assembly, wall rails, and attachments shall conform to the FBC.
- B. Design stairs and handrails to conform to ASCE 7.

1.4 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size, and type of fasteners, and accessories.
- C. Samples: Submit 1' long samples of handrail. Submit samples of elbow, tee, wall bracket, escutcheon and end stop.
- D. Certification: Submit written certification prepared, signed, and sealed by a Professional Engineer, registered to practice in the State of Florida verifying that the metal handrail system design meets indicated loading requirements and codes of authorities having jurisdiction.

PART 2 PRODUCTS

2.1 ALUMINUM RAILING SYSTEM
- A. Rails and Posts: 1½" outside diameter, excluding tubing conforming to ASTM B211
- B. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast aluminum
- C. Mounting:
  1. Provide adjustable brackets and flanges, with aluminum inserts for casting in concrete with aluminum brackets for embedding in masonry.
  2. Prepare backing plate for mounting in wall.
- D. Exposed Fasteners: Flush countersunk screws or bolts consistent with design of railing.
- E. Splice Connectors: Concealed spigots; cast aluminum.
- F. Exterior Aluminum Surfaces: Exterior anodized to clear color.
  1. May use an electrostatic painting system with prior approval by the District and the Architect, must provide minimum 3-year warranty.

G. Interior Aluminum Surfaces: Interior anodized to clear color.
   1. May use an electrostatic painting system with prior approval by the District and the Architect, must provide minimum 3-year warranty.
H. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.2 FABRICATION
A. Fit and shop assemble components as large as practical for delivery to site.
B. Fabricate components with joints tightly fitted and secured.
   1. Provide spigots and sleeves to accommodate site assembly and installation.
C. Provide anchors, plates, and angles required for connecting railings to structure.
D. Exposed Mechanical Fastenings, install flush-countersunk screws or bolts that are unobtrusively located and are consistent with the design of component.
E. Supply components required for anchorage of fabrications.
   1. Fabricate anchors and related components of same material and finish as fabrication, except as noted otherwise.
F. Exterior Components:
   1. Continuously seal joined pieces by continuous welds.
   2. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
G. Interior Components: Continuously seal joined pieces by continuous welds.
H. Grind exposed joints flush and smooth with adjacent finish surface.
   1. Make exposed joints butt tight, flush, and hairline.
   2. Ease exposed edges to small uniform radius.
I. Accurately form components to suit stairs and landings to each other and to building structure.
J. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

2.3 FINISHES
A. Exterior Aluminum Surfaces: Exterior anodized to clear color.
B. Interior Aluminum Surfaces: Interior anodized to clear color.
C. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementations or dissimilar materials.

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify that field conditions are acceptable and ready to receive work.

3.2 PREPARATION
A. Clean and strip aluminum where site welding is required.
B. Supply items being casted into concrete, embedded in masonry, or placed in partitions with setting templates to appropriate sections.

3.3 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Install components plumb and level, accurately fitted, free from distortion or defects.
C. Anchor railings to structure with anchor plates and angles.
D. Field weld anchors as indicated on shop drawings grind welds smooth and touch-up with primer.
E. Conceal bolts and screws whenever possible, if cannot, use flush countersunk fastenings.
F. Assemble with spigots and sleeves to accommodate tight joints and secure installation.
G. Install floor mounted support post plumb and secure in the concrete within a core-drilled hole

filled with epoxy grout.

H. All fasteners into concrete shall be stainless steel.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: ¼" per story, non-cumulative

B. Maximum Offset From True Alignment: ¼"

C. Maximum Out-of-Position: ¼"

END OF SECTION

SECTION 06 10 00
ROUG CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonstructural dimension lumber framing.

B. Rough opening framing for doors, windows, and roof openings.

C. Sheathing.

D. Roof-mounted curbs.

E. Fire retardant treated wood materials.

F. Miscellaneous framing and sheathing.

G. Communications and electrical room mounting boards.

H. Concealed wood blocking, nailers, and supports.

I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

C. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing 2003 (Reapproved 2017).

D. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.

E. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010 (Reapproved 2017).

F. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.

G. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing 2019a.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

I. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings 2018.

J. AWPA U1 - Use Category System: User Specification for Treated Wood 2018.

K. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers 2016, with Editorial Revision (2019).

L. PS 1 - Structural Plywood 2009 (Revised 2019).

M. PS 20 - American Softwood Lumber Standard 2020.

N. SPIB (GR) - Grading Rules 2014.

1.04 DELIVERY, STORAGE, AND ANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a two-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Wall Sheathing, For Curtain Wall parapets: Glass mat faced gypsum, ASTM C1177/C1177M, 5/8 inch Type X fire resistant.
   1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   2. Edges: Square.

B. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

D. Sill Flashing: As specified in Section 07 62 00.

E. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

F. Water-Resistive Barrier: Plastic sheet complying with ICC-ES AC38.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat exterior rough carpentry items.
      c. Do not use treated wood in direct contact with the ground.
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Interior rough carpentry items are to be fire retardant treated.
      c. Treat rough carpentry items as indicated .
      d. Do not use treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.

B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific nonstructural framing and blocking:
1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
2. Provide inlet diagonal bracing at corners.
3. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
4. Size: 48 by 96 inches, installed horizontally at ceiling height.

3.07 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.08 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 10 00

SECTION 07 05 53
FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting: Paint finish.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 01 21 00 - Allowances, for cash allowances affecting this section.

B. Allowance amount covers purchase, delivery, and installation.

1.03 REFERENCE STANDARDS

A. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

C. Schedule: Completely define scope of proposed marking, and indicate location of affected walls and partitions, and number of markings.

D. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 FIELD CONDITIONS

A. Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.

B. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

PART 2 PRODUCTS

2.01 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).

PART 3 EXECUTION

3.01 INSTALLATION

A. Locate markings as required by ICC (IBC).

B. Install neatly, with horizontal edges level.

C. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

END OF SECTION 07 05 53

SECTION 07 13 26
UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.01 SUMMARY

A. Products supplied under this section:
   1. Vapor barrier and installation accessories for installation under concrete slabs.

B. Related sections:
   1. Section 03 30 00 Cast-in-Place Concrete
   2. Section 07 26 00 Vapor Retarders

1.02 REFERENCES

A. ASTM International:
   1. ASTM E1745-17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   2. ASTM E1643-18a Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. Technical Reference - American Concrete Institute (ACI):
   1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
   2. ACI 302.1R-15 Guide to Concrete Floor and Slab Construction.

1.03 SUBMITTALS

A. Quality control/assurance:
   1. Summary of test results per paragraph 9.3 of ASTM E1745.
   2. Manufacturer's samples and literature.
   3. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
   4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vapor barrier shall have all of the following qualities:
   1. Maintain permeance of less than 0.01 Perms as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A.
      b. Thickness: 15 mils minimum
      c. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
   3. Vapor barrier products:
      a. Poly-America: Husky Yellowguard (15 mil)
      b. Stego Industries LLC.: Stego Wrap Vapor Barrier (15-mil)
      c. Tex-Trude LP: Xtreme Vapor Barrier (15-mil)
      d. W.R. Meadows, Inc.: Perminator (15-mil)

2.02 ACCESSORIES

A. Seams:
   1. Seam tape as recommended by membrane manufacturer.

B. Sealing Penetrations of Vapor barrier:
   1. Mastic as recommended by membrane manufacturer.
   2. Tape as recommended by membrane manufacturer.

PART 3 – EXECUTION

3.01 PREPARATION

A. Ensure that subsoil is approved by Geotechnical Engineer.
   1. Level and compact base material.

3.02 INSTALLATION

A. Install vapor barrier in accordance ASTM E1643.
   1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
   2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
      a. Seal vapor barrier to the entire slab perimeter per manufacturer's instructions.
   3. Overlap joints 6 inches and seal with manufacturer’s seam tape.
   4. Apply seam tape/Crete Claw to a clean and dry vapor barrier.
   5. Seal all penetrations (including pipes) per manufacturer’s instructions.
   6. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier.
   7. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
   8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
   9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.
   10. For vapor barrier-safe concrete screeding applications, install vapor barrier-safe screed system per manufacturer’s instructions prior to placing concrete.

END OF SECTION 07 13 26

SECTION 07 21 00
T ERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation and integral vapor retarder at perimeter foundation wall, underside of floor slabs, over roof deck, and exterior wall behind furring and gyp. board wall finish.

B. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2019.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C 2019a.

G. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components 2019.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

1.04 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
   1. Installer Qualification: Use accredited contractors, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.

B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

C. Insulation on Inside of Concrete and Masonry Exterior Walls: Polyisocyanurate board.

D. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.

E. Insulation at Structural Connections: Rigid, high-strength polyurethane.

2.02 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   4. Board Size: 48 inch by 96 inch.
   5. Board Edges: Square.
   6. Type and Compressive Resistance: Type XI, 5 psi (35 kPa), minimum.
   7. Type and Water Absorption: Type XI, 4.0 percent by volume, maximum, by total immersion.
   8. Type and Thermal Resistance, R-value: Type XI, 3.1 (0.55), minimum, per 1 inch thickness at 75 degrees F mean temperature.

B. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
   5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Board Edges: Square.
   7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.

C. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type I: Faced with aluminum foil on both major surfaces of the core foam.
         1) Class 1 - Non-reinforced core foam.
         2) Compressive Strength: 16 psi, minimum.
         3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0, minimum, at 75 degrees F.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Water Vapor Permeance: 1.2 perm, maximum, at 1 inch thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.
   5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Board Size: 48 inch by 96 inch.
   7. Board Thickness: 1.5 inch.
   8. Board Edges: Square.

2.03 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
2. Formaldehyde Content: Zero.

B. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Sheet Vapor Retarder: Black polyethylene film for above grade application, 10 mil, 0.010 inch thick.

B. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
1. Application: Sealing of interior circular penetrations, such as pipes or cables.
2. Width: Are required for application.

C. Flashing Tape: Special reinforced film with high performance adhesive.
1. Application: Window and door opening flashing tape.
2. Width: As required for application.

D. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.

E. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.

F. Insulation Fasteners: Lengths of unfinished, 13 gauge, 0.072 inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.

G. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inches wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
1. Tape seal joints.
2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:
1. Three continuous beads per board length.
2. Full bed 1/8 inch thick.

C. Install boards horizontally on foundation perimeter.
1. Place boards to maximize adhesive contact.
2. Install in running bond pattern.
3. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Extend boards over expansion joints, unbonded to foundation on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

F. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.
1. Apply adhesive in five continuous beads per board length.
2. Install boards horizontally from base of foundation to top of insulation.
3. Butt boards tightly, with joints staggered from insulation joints.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

A. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
   1. Tape seal joints between sheets.
   2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:
   1. Three continuous beads per board length.
   2. Full bed 1/8 inch thick.

C. Install boards horizontally on walls.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and protrusions.

D. Extend boards over expansion joints, unbonded to wall on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

F. Place 6 inches wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.

G. Tape insulation board joints.

3.04 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.05 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

A. Installation of board insulation over low slope roof deck, see Section [_____].

B. Board Installation Over Roof Deck, General:
   1. See applicable roofing specification section for specific board installation requirements.
   2. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.
   3. Fasten insulation to deck in accordance with roofing manufacturer's written instructions and applicable Factory Mutual requirements.
   4. Do not apply more insulation than can be covered with roofing on the same day.

3.06 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.07 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
   1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).
   2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.

3.08 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 21 00

SECTION 07 52 00
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot Applied 2-Ply Asphalt Roofing (StressPly). (2.9) (3.5)

B. Accessories. (2.19)

C. Edge Treatment and Roof Penetration Flashings. (2.20)(3.9)

1.2 RELATED SECTIONS

A. Section 06100 - Rough Carpentry.

B. Section 06114 - Wood Blocking and Curbing: Wood nailers and cant strips.

C. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.

D. Section 07710 - Manufactured Roof Specialties: Counter flashing gravel stops, and fascia.

E. Section 07724 - Roof Hatches: Frame and integral curb; Counter flashing.

F. Section 08950 - Translucent Wall and Roof Assemblies: Counter flashing

G. Section 08960 - Sloped Glazing Assemblies: Counter flashing.

H. Section 15120 - Piping Specialties: Roof Drains, Sumps.

1.3 REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

G. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

H. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

I. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

J. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

K. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

L. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

M. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

N. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

O. Factory Mutual Research (FM): Roof Assembly Classifications.

P. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

Q. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

R. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

S. Warnock Hersey (WH): Fire Hazard Classifications.

T. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

U. ASCE 7, Minimum Design Loads for Buildings and Other Structures

V. UL - Fire Resistance Directory.

W. FM Approvals - Roof Coverings and/or RoofNav assembly database.

X. FBC - Florida Building Code.

Y. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
   1. Factory Mutual Class A Rating.
   2. Underwriters Laboratory Class A Rating.
   3. Warnock Hersey Class A Rating.

C. Design Requirements:
   1. Uniform Wind Uplift Load Capacity
      a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
         1) Design Code: ASCE 7-16, Method 2 for Components and Cladding.
         2) Importance Category:
            a) II.
         3) Wind Speed: 170mph
         4) Exposure Category:

a) C.
5) Roof Pitch: 0.25:12.
6) Roof Area Design Uplift Pressure:
a) Zone 1 – 66 psf
b) Zone 2 – 86 psf
c) Zone 3 - 118

2. Live Load: 20 psf, or not to exceed original building design.
3. Dead Load:
   a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

D. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

E. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

F. Roof system shall have been tested in compliance with the following codes and test requirements:
1. Miami-Dade County:
   a. Torch and Mop Membrane Systems Over
      1) Lightweight Concrete Decks N.O.A.
         a) 21-1004.05
            1) PG#47-48
               a) System #2
   b. Roofing Underlayments
      1) Garland Underlayments N.O.A.
   c. Roofing Cements and Coatings
      1) Garland Coatings and Mastics N.O.A.
2. Underwriters Laboratories:
   a. Certification TGFU.R_____
3. Warnock Hersey
   a. ITS Directory of Listed Products
4. FM Approvals:
   a. RoofNav Website

1.5 SUBMITTALS

A. Provide the following to the Owner at the time of bid submittal:
1. Written certification from the roofing system manufacturer corporate officer certifying that the applicator is currently approved for installation of the specified roofing system.
2. Descriptive product data including MSD sheets.
3. Certification of Class A roof system.
4. Sample copy of contractor’s workmanship warranty.
5. Sample copy of specified Manufacturer’s warranty.
6. Sample copy of Manufacturer’s Architectural indemnification Agreement.

B. Product Data: Submit brochures containing material samples, SDS, schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.
1. Within four (4) weeks of award of contract, submit:

   a. Minimum of two (2) samples of each sheet material and descriptive literature.
   b. Manufacturer’s specifications and other independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" needed to prove compliance with specified requirements.

c. All other data and information to satisfy requirements of manufacturer on warranty needs.
d. A written statement from the roofing materials manufacturers corporate officer approving the installer and stating the intent to guarantee the completed project as specified.
e. Samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.

f. Certified copy of ISO 9001 compliance.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, including notation of roof slopes and fastening patterns of base modified bitumen membrane. Indicate size and materials. Show locations and installation procedures. Submit one electronic original prior to the job start and retain approved copies at the site.

D. Materials: Modified Bitumen Manufacturer must also manufacturer all edge metal and standing seam radius panels. Private labeling of material will not be permitted.

E. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-98 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins. Report shall be signed and sealed by a Professional Engineer registered in the State of Florida who has provided roof system attachment analysis for not less than 5 consecutive years.

F. Maintenance Procedures: Upon substantial completion of the project, deliver to Owner three (3) copies of manufacturers printed instructions regarding care and maintenance of the roof.

G. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
3. Product reflectivity and emissivity criteria to qualify for one point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.

H. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials

I. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

J. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

K. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

L. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwritters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

M. Closeout Submittals: Provide manufacturer's maintenance instructions that include

recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
1. Record minutes of the conference and provide copies to all parties present.
2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll.

During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition including Garland Metal Components.
   1. Warranty Period:
      a. 30 years from date of acceptance.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
   1. Warranty Period:
      a. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. Any alternate or substitution submittal must meet or exceed all aspects of the performance criteria of the basis of design.

D. Manufacturer of the modified bitumen must also manufacturer the edge metal for sole source warranty purposes and compatibility.

E. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.

1. Bidder will not be allowed to change materials after the bid opening date.
2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
   a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
   b. Will provide the same guarantee for substitution as for the product and method specified.
   c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
   d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
   e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
   f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.
6. Material substitution request must be submitted no later than 10 days prior to the bid submittal date for review.

2.2 HOT APPLIED 2-PLY ASPHALT ROOFING - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
   1. HPR Tri-Base Premium

B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressBase 80:

C. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive.
   1. StressPly E FR Mineral (Environmental):

D. Interply Adhesive: (1 and 2)
   1. HPR All-Temp Asphalt:

E. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. StressBase 80:

F. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. StressPly E FR Mineral (Environmental):

G. Flashing Ply Adhesive:
   1. HPR All-Temp Asphalt:

2.3 ACCESSORIES:

A. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum;

and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm) diameter are used.

B. Walkway Pads - Commercial Innovations Walkway Pads: As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.

C. Sealant - Green-Lock Structural Adhesive: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
1. Elongation, ASTM D 412: 300%
2. Hardness, Shore A, ASTM C 920: 50
3. Shear Strength, ASTM D 1002: 300 psi

D. Non-Shrink Grout GarRock: All weather fast setting chemical action concrete material to fill pitch pans.
1. Flexural Strength, ASTM C 78: (modified) 7 days 1100psi
2. High Strength, ASTM C 109: (modified) 24 days 8400lbs (3810kg)

E. Pitch Pocket Sealer - Seal-Tite: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.
1. Durometer, ASTM D 2240: 40-50 Shore
2. Elongation, ASTM D 412: 250%
3. Tensile Strength, ASTM D 412: 200 @ 100 mil

F. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Coping Cap: R-Mer Edge Coping Cap Cover and Splice Plate.
1. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .050" nom. or .063" nom

B. Pre-Manufactured Coping Cap: R-Mer Edge Coping Chairs
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

C. Pre-Manufactured Edge Metal Finishes:
1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
2. Exposed surfaces for coated panels:
a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer.
Weathering finish as referred by National Coil Coaters Association (NCCA).
Provided with the following properties.
1) Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
2) Bend: ASTM D-4145, O-T / NCCA II-19
3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion
6) Nominal Thickness: ASTM D1005
a) Primer: 0.2 mils
b) Topcoat, 0.7 mils min

c) Clear Coat (optional, only used with 22 ga. steel) 0.3 mils

7) Color: Provide as specified. (Subject to minimum quantities)

D. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

E. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

F. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

G. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

H. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
1. Tensile Strength, ASTM D 412: 400 psi
2. Elongation, ASTM D 412: 300%
3. Density @77 deg. F 8.5 lb/gal typical

I. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

J. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
4. Wherever necessary, all surfaces to receive roofing materials shall be power broom

and vacuumed to remove debris and loose matter prior to starting work.

5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Lightweight Insulating Concrete Deck

1. Lightweight insulating concrete decks are required to have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 125 psi (0.86 MPa) and a minimum density of 22 pcf (352 kg/sm).
2. Install roof system immediately following deck curing to prevent damage from exposure to precipitation. The deck manufacturer determines the minimum curing time and maximum exposure limitations.
3. LWIC shall not be poured during rainy periods. Deck areas that have frozen before they have cured shall be removed and replaced. Decks which receive precipitation prior to installation of the roof membrane shall be checked for moisture content and dryness.
4. Lightweight insulating concrete decks are acceptable only on slopes up to 1 inch per foot (83 mm/m).

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:

1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

A. Base/Felt Ply(s): Install base sheet or felt plies in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.

1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
2. Install base flashing ply to all perimeter and projection details after membrane application.
3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
4. Install base flashing ply to all perimeter and projection details.

5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
   1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
   2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
   3. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
   4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
   5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
   1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
   2. Wood nailers should match the height of any LWC insulation, providing a smooth and even transition between flashing and insulation areas.
   3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
   4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Solidly adhere the entire sheet of flashing membrane to the substrate.
   5. Seal all vertical laps of flashing membrane with a three-course application of trowel-

grade mastic and mesh.
6. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.

B. Scupper Through Wall (Overflow):
1. Inspect the nailer to assure proper attachment and configuration.
2. Run one ply over nailer up the overflow, into the scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
5. Strip in flange scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.

C. Pre-manufactured Snap-On Coping Cap:
1. Install miters first.
2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the

wall edge covering nailers completely, fastening 8 inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

3. Install minimum 16 gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
4. Install 6 inch wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

D. Curb Detail/Air Handling Station:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

E. Pre-manufactured Curb For Equipment Support:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Run all field plies over cant of the pre-manufactured equipment support a minimum of 2 inches.
3. Install base flashing ply covering pre-manufactured curb with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm) on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

F. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm) on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

G. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Taper LWC insulation to drain minimum of 24 inches (609 mm) from center of drain.
3. Run roof system plies over drain. Cut out plies inside drain bowl.

4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Install base flashing ply (40 inch square minimum) in bitumen.
6. Install modified membrane (48 inch square minimum) in bitumen.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

H. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

I. Pitch Pocket Umbrella:
1. Run all plies up to the penetration.
2. Place the pitch pocket over the penetration and prime all flanges.
3. Strip in flange of pitch pocket with one ply of base flashing ply. Extend 6 inches (152 mm) onto field of roof.
4. Install second layer of modified membrane extending 9 inches (228 mm) onto field of the roof.
5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
6. Caulk joint between roof system and pitch pocket with roof cement.
7. Place a watershedding type bonnet over the top of the pitch pocket and clamp the top with a drawband collar. Caulk the upper edge of the band with an elastomeric sealant.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations a minimum of three times per week while progress is being made on the project. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer for a minimum of 5 Years, and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
         2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. StressPly E FR Mineral (Environmental): 160 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) mineral surfaced rubber modified roofing membrane with fire retardant characteristics and reinforced with a dual fiberglass scrim and polyester scrim. ASTM D 6162, Type III Grade G
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf/in XD 550 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 87.5 kN/m XD 96.25 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 4003 N XD 4226 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

C. Interply Adhesive:
   1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:
      a. Softening Point 225 deg. F - 235 deg. F
      b. Flash Point 525 deg. F
      c. Penetration @ 77 deg. F 16-20 units
      d. Ductility @ 77 deg. F 1.5-2.0 cm

D. Flashing Base Ply:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
      2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
      2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 4 % XD 4 %
   d. Low Temperature Flexibility, ASTM D 5147
      1) Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:
1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:
   a. Softening Point 225 deg. F - 235 deg. F
   b. Flash Point 525 deg. F
   c. Penetration @ 77 deg. F 16-20 units
   d. Ductility @ 77 deg. F 1.5-2.0 cm

F. Surfacing:
1. Flashing Cap (Ply) Sheet:
   a. StressPly E FR Mineral (Environmental): 160 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) mineral surfaced rubber modified roofing membrane with fire retardant characteristics and reinforced with a dual fiberglass scrim and polyester scrim. ASTM D 6162, Type III Grade G
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf/in XD 550 lbf/in
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 87.5 kN/m XD 96.25 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 4003 N XD 4226 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
      4) Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

END OF SECTION

SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured roof specialties, including copings, fascias, and gravel stops.

B. Roof control and expansion joint covers.

C. Roof membrane vents.

1.02 RELATED REQUIREMENTS

A. Section 07 72 00 - Roof Accessories: Manufactured curbs, roof hatches, and snow guards.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.

C. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems 2017.

D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free 2007 (Reapproved 2018).

E. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

F. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials 2021a.

H. NRCA (RM) - The NRCA Roofing Manual 2019.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

D. Samples: Submit two appropriately sized samples of coping and gravel stop.

E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Roof edge, fascia, flashing, coping, etc. to be of the same manufacturer as the roofing system to allow for a full system warranty.

B. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
   1. Configuration: Fascia, cant, and edge securement for roof membrane.
   2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
   3. Exposed Face Height: As indicated on drawings.
   4. Material: Extruded aluminum, 0.08 inch thick, minimum.

5. Finish: 70 percent polyvinylidene fluoride.
6. Color: As indicated on drawings.

C. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.
2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
3. Wall Width: As indicated on drawings.
4. Outside Face Height: As indicated on drawings.
5. Inside Face Height: 4 inches.
6. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
7. Finish: 70 percent polyvinylidene fluoride.
8. Color: As indicated on drawings.

D. Control and Expansion Joint Covers: Composite construction of .040 inch wide flexible EPDM flashing of white color with closed cell urethane foam backing, each edge seamed to aluminum sheet metal flanges, designed for nominal joint width of 1 inch. Include special formed corners, tees, intersections, and wall flashings, each sealed watertight.

E. Roofing Vents: Formed aluminum .040 inch thick, with watertight construction to allow construction below roof membrane to breathe; with attachment flanges .040 inch wide.
1. Finish: Mill finish.
2. Color: To be selected by Architect from manufacturer's standard range.

F. Pipe and Penetration Flashing: Base of rounded aluminum, compatible with sheet metal roof systems, and capable of accomodating pipes sized between 3/8 inch and 12 inch.
1. Caps: Clear anodized.

G. Roof Penetration Sealing Systems: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.

H. Pipe Penetration Wall Seal: Seal for HVAC piping wall penetrations with wall mounted rigid plastic outlet cover and elastomeric wall seal gasket.
1. Wall Outlet Size, Stucco and Masonry Applications: 7-1/2 inch wide by 10 inch high.
a. Elastomeric Sleeve Diameter: 1-11/16 inch.
2. Outlet Cover Color: White.
3. Wall Outlet Water Penetration: Complies with ASTM E331 performance tests.
4. Wall Outlet Air Leakage: Complies with ASTM E283 performance tests.
5. Wall Outlet Air Permeance: Complies with ASTM E2178 performance tests.

I. Pipe Penetration Wall Seal and Insulated Piping Protection System: Seal for HVAC piping wall penetrations with wall mounted rigid plastic outlet cover and elastomeric wall seal gasket and having mechanical line insulation with PVC protective cover.
1. Wall Outlet Size, Stucco and Masonry Applications: 7-1/2 inch wide by 10 inch high.
a. Elastomeric Sleeve Diameter: 1-11/16 inch with applicable insulation thickness and PVC protective cover.
2. Outlet Cover Color: Gray.
3. PVC Insulation Cover Color: Black with full-length velcro fastener.
4. Wall Outlet Water Penetration: Complies with ASTM E331 performance tests.
5. Wall Outlet Air Leakage: Complies with ASTM E283 performance tests.
6. Wall Outlet Air Permeance: Complies with ASTM E2178 performance tests.

2.02 FINIS ES

A. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick.

B. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

2.03 ACCESSORIES

A. Sealant for Joints in Linear Components: As recommended by component manufacturer.

B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

C. Insulation Board Adhesive: Two-component, low-rise polyurethane foam adhesive used for adhering insulation to low slope roof deck materials.

D. Roof Cement: ASTM D4586/D4586M, Type II.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.
   1. Refer to Section 07 72 00 for information on roofing related accessories.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Seal joints within components when required by component manufacturer.

C. Anchor components securely.

D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

F. Coordinate installation of flashing flanges into reglets.

END OF SECTION 07 71 00

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Curbs.

B. Roof penetrations mounting curbs.

C. Roof hatches.

1.02 REFERENCE STANDARDS

A. 29 CFR 1910.23 - Ladders current edition.

B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

D. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.04 DELIVERY, STORAGE, AND ANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 ROOF CURBS

A. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
   1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
   2. Sheet Metal Material:
      a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
   3. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.

a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch clearance between curb and metal roof panel flange allowing water to properly flow past curb.
b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
c. Maintain at least 12 inch clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.

4. Provide layouts and configurations indicated on drawings.

2.02 ROOF ATC ES AND VENTS

A. Roof Hatch Manufacturers:
1. Activar Construction Products Group, Inc. - JL Industries; Diamond Series Roof Hatches, Model RHDG-1WT: www.activarcpg.com/#sle.
2. Babcock-Davis; Personnel II (Ladder Access): www.babcockdavis.com/#sle.
3. Bilco Company: www.bilco.com/#sle.
4. Precision Ladders, LLC; Model PH-A: www.precisionladders.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.
2. Curb Height: 12 inches from finished surface of roof, minimum.

C. Safety Railing System: Roof hatch manufacturer's standard accessory safety rail system mounted directly to curb.
1. Railing: Comply with 29 CFR 1910.23 for ladder safety, with a safety factor of two.
2. Posts and Rails: Galvanized steel tubing.
3. Finish: Manufacturer's standard, factory applied finish.
4. Gate Hinges and Post Guides: ASTM B221 (ASTM B221M), 6063 alloy, T5 temper aluminum.
5. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
6. Fasteners: Stainless steel, Type 316.

D. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
2. Hinges: Heavy duty pintle type.
3. Hold open arm with vinyl-coated handle for manual release.
4. Latch: Upon closing, engage latch automatically and reset manual release.
5. Manual Release: Pull handle on interior.
6. Locking: Padlock hasp on interior.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 72 00

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

B. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems 2015 (Reapproved 2019).

C. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems 2020a.

D. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers 2020a.

E. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus 2020.

F. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies 2013 (Reapproved 2017).

G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015 (Reapproved 2021)e1.

H. ITS (DIR) - Directory of Listed Products current edition.

I. FM 4991 - Approval Standard for Firestop Contractors 2013.

J. FM (AG) - FM Approval Guide current edition.

K. SCAQMD 1168 - Adhesive and Sealant Applications 1989 (Amended 2017).

L. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems Current Edition, Including All Revisions.

M. UL (DIR) - Online Certifications Directory Current Edition.

N. UL (FRD) - Fire Resistance Directory Current Edition.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.

E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Certificate from authority having jurisdiction indicating approval of materials used.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

1. Listing in UL (FRD) or FM (AG) will be considered as constituting an acceptable test report.
2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
1. Trained by manufacturer.
2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
3. Verification of minimum three years documented experience installing work of this type.
4. Verification of at least five satisfactorily completed projects of comparable size and type.
5. Licensed by local authorities having jurisdiction (AHJ).

1.05 MOCK-UP

A. Install one firestopping assembly representative of each fire rating design required on project.
1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.

B. Obtain approval of authorities having jurisdiction (AHJ) before proceeding.

C. If accepted, mock-up will represent minimum standard for this work.

D. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:
1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
2. A/D Fire Protection Systems Inc: www.adfire.com/#sle.
3. Hilti, Inc: www.us.hilti.com/#sle.
4. HoldRite, a Brand of Reliance Worldwide Corporation; HydroFlame 100 Intumescent Firestop Sealant: www.holdrite.com/#sle.
5. Nelson FireStop Products: www.nelsonfirestop.com/#sle.
6. Passive Fire Protection Partners; Firestop 3600EX: www.firestop.com/#sle.
7. Specified Technologies Inc: www.stifirestop.com/#sle.
8. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com/#sle.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.

C. Mold and Mildew Resistance: Provide firestoppping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

E. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.
   2. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   3. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   4. Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated.

B. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

C. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.
   2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
   4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
   4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.04 FIRESTOPPING FOR PERIMETER CONTAINMENT

A. Perimeter Joint Systems That Have Not Been Tested For Movement Capabilities (Static-S):
   1. 2 Hour Construction: UL System CW-S-0002; Specified Technologies Inc. AS200 Elastomeric Spray.
   2. 2 Hour Construction: UL System CW-S-0002; Specified Technologies Inc. Fast Tack Firestop Spray.
   3. 2 Hour Construction: UL System CW-S-0003; Specified Technologies Inc. Fast Tack Firestop Spray.
   4. 2 Hour Construction: UL System CW-S-0007; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.

B. Perimeter Joint Systems That Have Movement Capabilities (Dynamic-D):
   1. 2 Hour Construction: UL System CW-D-1004; Specified Technologies Inc. AS200 Elastomeric Spray.
   2. 2 Hour Construction: UL System CW-D-1004; Specified Technologies Inc. Fast Tack Firestop Spray.
   3. 2 Hour Construction: UL System CW-D-1011; Specified Technologies Inc. Fast Tack Firestop Spray.
   4. 2 Hour Construction: UL System CW-D-2042; Specified Technologies Inc. Fast Tack Firestop Spray.

2.05 FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, EAD-OF-WALL, AND WALL-TO-WALL OINTS

A. Concrete and Concrete Masonry Walls and Floors:
   1. Floor-to-Floor Joints:
      a. 2 Hour Construction: UL System FF-D-1013; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System FF-D-1085; Tremco, TREMstop Acrylic Firestop Sealant.
   2. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
      a. 2 Hour Construction: UL System HW-D-0181; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System HW-D-1037; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   3. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Floor:
      a. 2 Hour Construction: UL System HW-D-0268; Hilti CP 606 Flexible Firestop Sealant.
      b. 2 Hour Construction: UL System HW-D-0312; Specified Technologies Inc. SIL Silicone Sealant.
   4. Concrete/Concrete Masonry Wall-to-Wall Joint Systems That Have Movement Capabilities (Dynamic-D):
      a. 2 Hour Construction: UL System WW-D-0017; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System WW-D-0032; Hilti CP 606 Flexible Firestop Sealant.

B. Gypsum Board Walls:
   1. Wall-to-Wall Joints That Have Not Been Tested For Movement Capabilities (Static-S):
      a. 2 Hour Construction: UL System WW-S-0063; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
      b. 1 Hour Construction: UL System WW-S-0063; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
   2. Wall-to-Wall Joints That Have Movement Capabilities (Dynamic-D):
      a. 2 Hour Construction: UL System WW-D-0180; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
      b. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
      c. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
   3. Head-of-Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
      a. 2 Hour Construction: UL System HW-D-0252; Specified Technologies Inc. AS200 Elastomeric Spray.
      b. 2 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      c. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   4. Head-of-Wall Joints at Concrete Over Metal Deck:
      a. 2 Hour Construction: UL System HW-D-0034; Specified Technologies Inc. ES Elastomeric Firestop Sealant.
      b. 2 Hour Construction: UL System HW-D-0043; Specified Technologies Inc. AS200 Elastomeric Spray.
      c. 2 Hour Construction: UL System HW-D-0099; Specified Technologies Inc. SpeedFlex Joint Profile System.
      d. 2 Hour Construction: UL System HW-D-0363; Specified Technologies Inc. SpeedFlex Joint Profile System.
      e. 2 Hour Construction: UL System HW-D-0365; Specified Technologies Inc. SpeedFlex Joint Profile System.

f. 2 Hour Construction: UL System HW-D-0548; Specified Technologies Inc. SpeedFlex Joint Profile System.
g. 2 Hour Construction: UL System HW-D-0749; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
h. 2 Hour Construction: UL System HW-D-0256; Tremco, TREMstop Acrylic Firestop Sealant.

5. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Parallel to Ribs:
   a. 2 Hour Construction: UL System HW-D-0049; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 2 Hour Construction: UL System HW-D-0184; Hilti CP 606 Flexible Firestop Sealant.
6. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Cut to Fit Ribs:
   a. 2 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
   b. 2 Hour Construction: UL System HW-D-0103; Specified Technologies Inc. ES Elastomeric Firestop Sealant.
7. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Not Cut to Fit:
   a. 2 Hour Construction: UL System HW-D-0042; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 2 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.

2.06 FIRESTOPPING PENETRATIONS T ROUG CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Blank Openings:
   1. In Floors or Walls:
      a. 2 Hour Construction: UL System C-AJ-0090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System C-AJ-0015; Specified Technologies Inc. SSM Mortar.
      c. 2 Hour Construction: UL System C-AJ-0116; Specified Technologies Inc. Composite Sheet.
      d. 2 Hour Construction: UL System C-AJ-0136; Specified Technologies Inc. SSM Mortar.

B. Penetrations Through Floors or Walls By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System C-AJ-8035; Specified Technologies Inc. SSM Mortar.
      c. 2 Hour Construction: UL System C-AJ-8055; Specified Technologies Inc. SSP Firestop Putty.
      d. 2 Hour Construction: UL System C-AJ-8093; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
      e. 2 Hour Construction: UL System C-AJ-8114; Specified Technologies Inc. SSM Mortar.
      f. 2 Hour Construction: UL System C-AJ-8115; Specified Technologies Inc. SSM Mortar.
      g. 2 Hour Construction: UL System C-AJ-8181; Specified Technologies Inc. Composite Sheet.
      h. 2 Hour Construction: UL System C-AJ-8220; Specified Technologies Inc. SSM Mortar.
   2. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System C-AJ-1090; Specified Technologies Inc. SSP Firestop Putty.

b. 2 Hour Construction: UL System C-AJ-1198; Specified Technologies Inc. SIL Silicone Sealant.
c. 2 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
d. 2 Hour Construction: UL System C-AJ-1240; Specified Technologies Inc. LC Endothermic Firestop Sealant.
e. 2 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System C-AJ-2167; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
   c. 2 Hour Construction: UL System C-AJ-2106; Specified Technologies Inc. SSW Wrap Strips.
   d. 2 Hour Construction: UL System C-AJ-2282; Specified Technologies Inc. SSW Wrap Strips.
   e. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSC Collars.
   f. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSW Wrap Strips.
   g. 2 Hour Construction: UL System C-AJ-2298; Specified Technologies Inc. LCC Intumescent Firestop Collars.
   h. 2 Hour Construction: UL System C-AJ-2588; Specified Technologies Inc. RTC Range-Taking Collar.
   i. 2 Hour Construction: UL System C-AJ-2772; Specified Technologies Inc. SSW Wrap Strips.
   j. 2 Hour Construction: UL System C-BJ-2021; Hilti CP 643N Firestop Collar.
4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System C-AJ-3213; Specified Technologies Inc. LCC Intumescent Firestop Collars.
   b. 2 Hour Construction: UL System C-AJ-3213; Specified Technologies Inc. SSC Collars.
   c. 2 Hour Construction: UL System W-J-3046; Specified Technologies Inc. SSP Firestop Putty.
   d. 2 Hour Construction: UL System C-AJ-3154; Specified Technologies Inc. SSP Firestop Putty.
   e. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
   f. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit.
   g. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
   h. 2 Hour Construction: UL System W-J-3198; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
   i. 2 Hour Construction: UL System W-J-3199; Hilti CFS-SL SK Firestop Sleeve Kit.
5. Cable Trays with Electrical Cables:
   a. 2 Hour Construction: UL System C-AJ-4094; Hilti CFS-BL Firestop Block.
6. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5087; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System C-AJ-5138; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System C-AJ-5313; Specified Technologies Inc. LC Endothermic Firestop Sealant.
7. HVAC Ducts, Uninsulated:

a. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE MAX Intumescent Firestop Sealant.

C. Penetrations Through Floors By:
1. Multiple Penetrations in Large Openings:
a. 2 Hour Construction: UL System F-A-8012; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System F-A-1016; Hilti CP 680-P/M Cast-In Device.
b. 2 Hour Construction: UL System F-A-1110; Specified Technologies Inc. CID Cast-In Device.
c. 2 Hour Construction: UL System F-A-1129; Specified Technologies Inc. Closet Flange Firestop Gasket.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System F-A-2065; Hilti CP 680-P Cast-In Device.
b. 2 Hour Construction: UL System F-A-2213; Hilti CFS-DID Drop-In Device.
c. 2 Hour Construction: UL System F-A-2053; Hilti CP 680-P Cast-In Device.
d. 2 Hour Construction: UL System F-A-2216; Specified Technologies Inc. Closet Flange Firestop Gasket.
e. 2 Hour Construction: UL System F-A-2246; Specified Technologies Inc. CID Cast-In Device.
4. Electrical Cables Not In Conduit:
a. 2 Hour Construction: UL System F-A-3033; Hilti CP 680-P/M Cast-In Device.
b. 2 Hour Construction: UL System F-A-3032; Specified Technologies Inc. Ready Split Sleeve.
c. 2 Hour Construction: UL System F-A-3058; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
5. Electrical Busways:
a. 2 Hour Construction: UL System F-A-6002; Hilti CP 604 Self-Leveling Firestop Sealant.
6. Insulated Pipes:
a. 2 Hour Construction: UL System F-A-5015; Hilti CP 680-P/M Cast-In Device.
b. 2 Hour Construction: UL System F-A-5017; Hilti CP 680-P/M Cast-In Device.
c. 2 Hour Construction: UL System F-A-5041; Specified Technologies Inc. CID Cast-In Device.
d. 2 Hour Construction: UL System F-A-5045; Specified Technologies Inc. CID Cast-In Device.

D. Penetrations Through Walls By:
1. Uninsulated Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
b. 1 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
2. Electrical Cables Not In Conduit:
a. 2 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
b. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
c. 2 Hour Construction: UL System W-J-3090; Specified Technologies Inc. SSP Firestop Putty.
d. 2 Hour Construction: UL System W-J-3098; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
e. 2 Hour Construction: UL System W-J-3130; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
f. 2 Hour Construction: UL System W-J-3138; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.

g. 2 Hour Construction: UL System W-J-3141; Specified Technologies Inc. Ready-Sleeve.
h. 2 Hour Construction: UL System W-J-3156; Specified Technologies Inc. Ready Split Sleeve.
i. 2 Hour Construction: UL System W-J-3158; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
j. 2 Hour Construction: UL System W-J-3180; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
k. 2 Hour Construction: UL System W-J-3182; Specified Technologies Inc. Ready Split Sleeve.
l. 2 Hour Construction: UL System W-J-3182; Specified Technologies Inc. Ready-Sleeve.

3. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
4. HVAC Ducts, Uninsulated:
   a. 2 Hour Construction: UL System W-J-7092; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   b. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE MAX Intumescent Firestop Sealant, or CP 606 Flexible Firestop Sealant.
5. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-J-7112; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.07 FIRESTOPPING PENETRATIONS T ROUG GYPSUM BOARD WALLS

A. Blank Openings:
   1. 2 Hour Construction: UL System W-L-0020; Specified Technologies Inc. Composite Sheet.
   2. 2 Hour Construction: UL System W-L-0032; Specified Technologies Inc. FP Intumescent Firestop Plug.
   3. 2 Hour Construction: UL System W-L-0038; Specified Technologies Inc. FP Intumescent Firestop Plug.
   4. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
   5. 1 Hour Construction: UL System W-L-0020; Specified Technologies Inc. Composite Sheet.
   6. 1 Hour Construction: UL System W-L-0032; Specified Technologies Inc. FP Intumescent Firestop Plug.
   7. 1 Hour Construction: UL System W-L-0038; Specified Technologies Inc. FP Intumescent Firestop Plug.
   8. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

B. Penetrations By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
      c. 2 Hour Construction: UL System W-L-8025; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
      d. 2 Hour Construction: UL System W-L-8050; Specified Technologies Inc. SSB Intumescent Firestop Pillows.

e. 2 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
f. 2 Hour Construction: UL System W-L-8073; Specified Technologies Inc. Composite Sheet.
g. 2 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
h. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
i. 1 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
j. 1 Hour Construction: UL System W-L-8025; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
k. 1 Hour Construction: UL System W-L-8050; Specified Technologies Inc. SSB Intumescent Firestop pillows.
l. 1 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
m. 1 Hour Construction: UL System W-L-8073; Specified Technologies Inc. Composite Sheet.
n. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2. Uninsulated Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-L-1033; Specified Technologies Inc. SIL Silicone Sealant.
   b. 2 Hour Construction: UL System W-L-1042; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
   c. 2 Hour Construction: UL System W-L-1049; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-1090; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   e. 2 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   f. 2 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   g. 2 Hour Construction: UL System W-L-1222; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   h. 2 Hour Construction: UL System W-L-1477; Specified Technologies Inc. EZ Firestop Grommet.
   i. 2 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.
   j. 1 Hour Construction: UL System W-L-1042; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
   k. 1 Hour Construction: UL System W-L-1049; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   l. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   m. 1 Hour Construction: UL System W-L-1090; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   n. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   o. 1 Hour Construction: UL System W-L-1222; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   p. 1 Hour Construction: UL System W-L-1477; Specified Technologies Inc. EZ Firestop Grommet.
   q. 1 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-L-2048; Specified Technologies Inc. SSW Wrap Strips.

b. 2 Hour Construction: UL System W-L-2074; Specified Technologies Inc. SSC Collars.
c. 2 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
d. 2 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
e. 2 Hour Construction: UL System W-L-2237; Specified Technologies Inc. LCC Intumescent Firestop Collars.
f. 2 Hour Construction: UL System W-L-2241; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
g. 2 Hour Construction: UL System W-L-2243; Specified Technologies Inc. SSW Wrap Strips.
h. 2 Hour Construction: UL System W-L-2493; Specified Technologies Inc. RTC Range-Taking Collar.
i. 1 Hour Construction: UL System W-L-2048; Specified Technologies Inc. SSW Wrap Strips.
j. 1 Hour Construction: UL System W-L-2074; Specified Technologies Inc. SSC Collars.
k. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
l. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
m. 1 Hour Construction: UL System W-L-2237; Specified Technologies Inc. LCC Intumescent Firestop Collars.
n. 1 Hour Construction: UL System W-L-2241; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
o. 1 Hour Construction: UL System W-L-2243; Specified Technologies Inc. SSW Wrap Strips.
p. 1 Hour Construction: UL System W-L-2493; Specified Technologies Inc. RTC Range-Taking Collar.

4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System W-L-3024; Specified Technologies Inc. SSP Firestop Putty.
   b. 2 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
   c. 2 Hour Construction: UL System W-L-3076; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-3084; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   e. 2 Hour Construction: UL System W-L-3135; Specified Technologies Inc. SSP Firestop Putty.
   f. 2 Hour Construction: UL System W-L-3169; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   g. 2 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   h. 2 Hour Construction: UL System W-L-3255; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   i. 2 Hour Construction: UL System W-L-3256; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   j. 2 Hour Construction: UL System W-L-3265; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   k. 2 Hour Construction: UL System W-L-3303; Specified Technologies Inc. Ready Split Sleeve.
   l. 2 Hour Construction: UL System W-L-3306; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
   m. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

n. 2 Hour Construction: UL System W-L-3350; Specified Technologies Inc. LC Endothermic Firestop Sealant.
o. 2 Hour Construction: UL System W-L-3357; Specified Technologies Inc. FP Intumescent Firestop Plug.
p. 2 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready Split Sleeve.
q. 2 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready-Sleeve.
r. 2 Hour Construction: UL System W-L-3369; Specified Technologies Inc. EZ Firestop Grommet.
s. 2 Hour Construction: UL System W-L-3370; Specified Technologies Inc. EZ Firestop Grommet.
t. 2 Hour Construction: UL System W-L-3374; Specified Technologies Inc. FP Intumescent Firestop Plug.
u. 2 Hour Construction: UL System W-L-3376; Specified Technologies Inc. Ready-Sleeve.
v. 2 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
w. 2 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
x. 2 Hour Construction: UL System W-L-3378; Specified Technologies Inc. EZ Firestop Grommet.
y. 2 Hour Construction: UL System W-L-3379; Specified Technologies Inc. EZ Firestop Grommet.
z. 2 Hour Construction: UL System W-L-3390; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
aa. 2 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
bb. 2 Hour Construction: UL System W-L-3395; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
cc. 2 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.
dd. 1 Hour Construction: UL System W-L-3024; Specified Technologies Inc. SSP Firestop Putty.
ee. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
ff. 1 Hour Construction: UL System W-L-3076; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
gg. 1 Hour Construction: UL System W-L-3084; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
hh. 1 Hour Construction: UL System W-L-3135; Specified Technologies Inc. SSP Firestop Putty.
ii. 1 Hour Construction: UL System W-L-3169; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
jj. 1 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
kk. 1 Hour Construction: UL System W-L-3255; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
ll. 1 Hour Construction: UL System W-L-3256; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
mm. 1 Hour Construction: UL System W-L-3265; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
nn. 1 Hour Construction: UL System W-L-3303; Specified Technologies Inc. Ready Split Sleeve.
oo. 1 Hour Construction: UL System W-L-3306; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.

pp. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
qq. 1 Hour Construction: UL System W-L-3350; Specified Technologies Inc. LC Endothermic Firestop Sealant.
rr. 1 Hour Construction: UL System W-L-3357; Specified Technologies Inc. FP Intumescent Firestop Plug.
ss. 1 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready Split Sleeve.
tt. 1 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready-Sleeve.
uu. 1 Hour Construction: UL System W-L-3369; Specified Technologies Inc. EZ Firestop Grommet.
vv. 1 Hour Construction: UL System W-L-3370; Specified Technologies Inc. EZ Firestop Grommet.
ww. 1 Hour Construction: UL System W-L-3374; Specified Technologies Inc. FP Intumescent Firestop Plug.
xx. 1 Hour Construction: UL System W-L-3376; Specified Technologies Inc. Ready-Sleeve.
yy. 1 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
zz. 1 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
aaa. 1 Hour Construction: UL System W-L-3378; Specified Technologies Inc. EZ Firestop Grommet.
bbb. 1 Hour Construction: UL System W-L-3379; Specified Technologies Inc. EZ Firestop Grommet.
ccc. 1 Hour Construction: UL System W-L-3390; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
ddd. 1 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
eee. 1 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.

5. Cable Trays with Electrical Cables:
   a. 2 Hour Construction: UL System W-L-4008; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   b. 2 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   c. 2 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System W-L-4008; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   e. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   f. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
6. Insulated Pipes:
   a. 2 Hour Construction: UL System W-L-5014; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-5121; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   e. 2 Hour Construction: UL System W-L-5273; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   f. 2 Hour Construction: UL System W-L-5298; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
   g. 1 Hour Construction: UL System W-L-5014; Specified Technologies Inc. SSS Intumescent Firestop Sealant.

h. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
i. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
j. 1 Hour Construction: UL System W-L-5121; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
k. 1 Hour Construction: UL System W-L-5273; Specified Technologies Inc. LC Endothermic Firestop Sealant.
l. 1 Hour Construction: UL System W-L-5298; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).

7. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-7164; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   c. 2 Hour Construction: UL System W-L-7238; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   d. 1 Hour Construction: UL System W-L-7164; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   e. 1 Hour Construction: UL System W-L-7238; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   f. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.04 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 84 00

SECTION 07 92 00
OINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.

B. Section 07 84 00 - Firestopping: Firestopping sealants.

C. Section 08 71 00 - Door Hardware: Setting exterior door thresholds in sealant.

D. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

E. Section 23 31 00 - HVAC Ducts and Casings: Duct sealants.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.

C. ASTM C834 - Standard Specification for Latex Sealants 2017.

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2019.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems 2016.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.

I. ASTM C1311 - Standard Specification for Solvent Release Sealants 2014.

J. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.

K. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2019 (Reapproved 2020).

L. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).

M. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Substrates for which laboratory adhesion and/or compatibility testing is required.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, color, manufacturer and product name for each application.

F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

H. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Allow sufficient time for testing to avoid delaying the work.
   4. Deliver to manufacturer sufficient samples for testing.
   5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.
   2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
      a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
      b. If any failures occur in the first 10 linear feet, continue testing at 12 inches intervals at no extra cost to Owner.
   3. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
      a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
      b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to Owner.
   4. Field testing agency's qualifications.
   5. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

F. Field Adhesion Test Procedures:
   1. Allow sealants to fully cure as recommended by manufacturer before testing.
   2. Have a copy of the test method document available during tests.
   3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
   4. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
   5. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
   6. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

G. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
   1. Record results on Field Quality Control Log.
   2. Repair failed portions of joints.

H. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
   1. Sample: At least 18 inches long.
   2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
   3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
   4. Record results on Field Quality Control Log.
   5. Repair failed portions of joints.

I. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   2. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.
   3. Pecora Corporation: www.pecora.com/#sle.
   4. Sika Corporation: www.usa-sika.com/#sle.
   5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   6. W.R. Meadows, Inc: www.wrmeadows.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   2. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.

3. Pecora Corporation: www.pecora.com/#sle.
4. Sika Corporation: www.usa-sika.com/#sle.
5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
6. W.R. Meadows, Inc: www.wrmeadows.com/#sle.

2.02 OINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.
      e. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
         1) Exception: Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
      c. Other joints indicated below.
   3. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      d. Joints where installation of sealant is specified in another section.
      e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
   1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
   2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
   3. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
   2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
   3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
   4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
   5. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.
   6. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
   7. Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.

D. Interior Wet Areas: Bathrooms, restrooms, and Break Rooms; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.03 OINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 61 16.

2.04 NONSAG OINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   5. Color: Match adjacent finished surfaces.
   6. Manufacturers:
      a. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
      b. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
      c. Sika Corporation; Sikasil WS-290: www.usa-sika.com/#sle.
      d. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosealants.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Silicone Sealant: ASTM C920, Grade NS, Use T; single-component, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
   1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
   2. Color: Dark Gray.
   3. Manufacturers:
      a. Dow; DOWSIL NS Parking Structure Sealant: www.dow.com/#sle.
      b. Pecora Corporation; Pecora 301 NS (Non-Sag): www.pecora.com/#sle.
      c. Tremco Commercial Sealants & Waterproofing; Spectrem 800: www.tremcosealants.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: Match adjacent finished surfaces.
   4. Cure Type: Single-component, neutral moisture curing
   5. Service Temperature Range: Minus 65 to 180 degrees F.
   6. Manufacturers:
      a. Dow; DOWSIL 999-A Building and Glazing Sealant: www.dow.com/#sle.
      b. Pecora Corporation; Pecora 860: www.pecora.com/#sle.
      c. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   1. Color: White.
   2. Manufacturers:
      a. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
      b. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

E. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus [____] percent, minimum.

2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: Match adjacent finished surfaces.
4. Manufacturers:
   a. Master Builders Solutions; MasterSeal NP1: www.master-builders-solutions.com/en-us/#sle.
   b. Pecora Corporation; DynaFlex: www.pecora.com/#sle.
   c. Sika Corporation; Sikaflex-1a: www.usa-sika.com/#sle.
   d. Tremco Commercial Sealants & Waterproofing; Dymeric 240 FC: www.tremcosealants.com/#sle.
   e. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com/#sle.
   f. Substitutions: See Section 01 60 00 - Product Requirements.

F. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
1. Movement Capability: Plus and minus 35 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: Match adjacent finished surfaces.
4. Manufacturers:
   a. Sika Corporation; Sikaflex-1a: www.usa-sika.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: Standard colors matching finished surfaces, Type OP (opaque).
2. Grade: ASTM C834; Grade Minus 18 Degrees C (0 Degrees F).
3. Manufacturers:
   a. Master Builders Solutions; MasterSeal NP 520: www.master-builders-solutions.com/en-us/#sle.
   b. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle.
   c. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

H. Non-Curing Butyl Sealant: Solvent-based, single component, non-sag, non-skinning, non-hardening, non-bleeding; non-vapor-permeable; intended for fully concealed applications.
1. Manufacturers:
   a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant: www.pecora.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 SELF-LEVELING SEALANTS

A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Manufacturers:
   a. Pecora Corporation: www.pecora.com/#sle.
   b. Sika Corporation; Sikaflex-1c SL: www.usa-sika.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-Leveling Polyurethane Sealant for Horizontal Expansion Joints: ASTM C920, Grade P, Uses T, M and O; multi-component; explicitly approved by manufacturer for horizontal expansion joints.
1. Movement Capability: Plus and minus 25 percent, minimum.

2. Hardness Range: 30 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: Limestone.
4. Manufacturers:
   a. Pecora Corporation; DynaTrol II-SG (Slope Grade): www.pecora.com/#sle.
   b. Tremco Commercial Sealants & Waterproofing; THC-901: www.tremcosealants.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Manufacturers:
   a. Sika Corporation; Sikaflex-1c SL: www.usa-sika.com/#sle.
   b. W. R. MEADOWS, Inc; POURTHANE SL: www.wrmeadows.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

D. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. Composition: Multi-component, 100 percent solids by weight.
2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
3. Color: Concrete gray.
4. Joint Width, Minimum: 1/8 inch.
5. Joint Width, Maximum: 1/4 inch.
6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
7. Manufacturers:
   a. Euclid Chemical Company; EUCO 700: www.euclidchemical.com/#sle.
   b. Nox-Crete Inc; DynaFlex 502: www.nox-crete.com/#sle.
   c. W.R. Meadows, Inc; Rezi-Weld Flex: www.wrmeadows.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
2. Color: Concrete gray.
3. Joint Width, Minimum: 1/8 inch.
4. Joint Width, Maximum: 3/4 inch.
5. Joint Depth: Provide product suitable for joints from 1/8 inch to 1 inch in depth excluding space for backer rod.
6. Manufacturers:
   a. ARDEX Engineered Cements; ARDEX ARDISEAL RAPID PLUS: www.ardexamericas.com/#sle.
   b. Euclid Chemical Company; EUCO QWIKjoint UVR: www.euclidchemical.com/#sle.
   c. Nox-Crete Inc; DynaFlex JF-85: www.nox-crete.com/#sle.
   d. Rust-Oleum Corporation; Concrete Saver Flexible Joint Sealant: www.rustoleum.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

F. Semi-Self-Leveling Polyurethane Sealant: Intended for expansion joints in sidewalks, swimming pool decks, plazas, floors and other horizontal surfaces with up to 6 percent slope.
1. Composition: Single or multi-component.

2. Durometer Hardness, Type A: 35 to 45, minimum, when tested in accordance with ASTM D2240.
3. Color: To be selected by Architect from manufacturer's standard colors.
4. Manufacturers:
   a. Tremco Commercial Sealants & Waterproofing; Vulkem 45 SSL: www.tremcosealants.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Polyurethane-Methacrylate (PUMA) Expansion Joint System: Intended for expansion joints in exposed multi-story parking garages, and includes aluminum tape, primer, joint compound material, and top coat.
1. Durometer Hardness, Shore A: 65 to 87, minimum, when tested in accordance with ASTM D2240.
2. Top Coat Color: Gray.
3. Tensile Strength: 752 psi, minimum, when tested in accordance with ASTM D412.
4. Manufacturers:
   a. Tremco Commercial Sealants & Waterproofing; Tremco PUMA Expansion Joint System (EJS): www.tremcosealants.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
3. Open Cell: 40 to 50 percent larger in diameter than joint width.
4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
5. Manufacturers:
   a. ADFAST Corporation; ADSEAL BR-2600 (Backer Rod): www.adfastcorp.com/#sle.
   b. Nomaco, Inc: www.nomaco.com/#sle.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.

C. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.

D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

E. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION 07 92 00

SECTION 07 95 13
EXPANSION OINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Expansion joint cover assemblies for floor, wall, and ceiling surfaces.

1.02 RELATED REQUIREMENTS

A. Section 03 10 00 - Concrete Forming and Accessories: Placement of joint cover assembly frames in formwork.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof expansion and control joint covers.

C. Section 07 71 00 - Roof Specialties: Roof expansion and control joint covers.

D. Section 07 92 00 - Joint Sealants: Sealing expansion and control joints using gunnable and pourable sealants.

E. Section 09 21 16 - Gypsum Board Assemblies: Placement of expansion joint assemblies in gypsum board walls and ceilings.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

C. ASTM B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Installation Templates: For frames and anchors to be embedded in concrete or masonry, furnish templates to relevant installers; include installation instructions and tolerances.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices and available colors and finish.

C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, affected adjacent construction and anchorage locations.

D. Samples: Submit two samples 4 inch long, illustrating profile, dimension, color, and finish selected.

E. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Expansion Joint Cover Assemblies:
   1. BASF Watson Bowman Acme Corporation: www.wbacorp.com/#sle.
   2. Construction Specialties, Inc: www.c-sgroup.com/#sle.
   3. EMSEAL Joint Systems, Ltd: www.emseal.com/#sle.
   4. Inpro: www.inprocorp.com/#sle.
   5. Pecora Corporation: www.pecora.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 EXPANSION OINT COVER ASSEMBLY APPLICATIONS

A. Interior Floor Joints Subject to Thermal Movement:
   1. Manufacturers:

a. BASF Watson Bowman Acme Corporation; Wabo CorridorWrap Floor: www.wbacorp.com/#sle.
b. Construction Specialties, Inc; Allway Standard Metal Floor Covers: www.c-sgroup.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Interior Wall/Ceiling Joints Subject to Thermal Movement:
1. Manufacturers:
a. Construction Specialties, Inc; Allway Standard Wall and Ceiling Covers: www.c-sgroup.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Exterior Wall Joints Subject to Thermal Movement:
1. Manufacturers:
a. Construction Specialties, Inc; Exterior Wall Covers: www.c-sgroup.com/#sle.
b. EMSEAL Joint Systems, Ltd; BG System: www.emseal.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

D. Parking/Bridge Deck Joints:
1. Manufacturers:
a. Construction Specialties, Inc; Parking Garage and Stadium Covers: www.c-sgroup.com/#sle.
b. EMSEAL Joint Systems, Ltd; Migutan FP110: www.emseal.com/#sle.
c. Pecora Corporation; Premolded DynaSpan with DynaTred Sealant: www.pecora.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 EXPANSION OINT COVER ASSEMBLIES

A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
1. Joint Dimensions and Configurations: As indicated on drawings.
2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
3. Joint Movement Capability: If not indicated, provide minimum plus/minus 25 percent joint movement capability.
4. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
5. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

B. Floor Joint Covers: Coordinate with indicated floor coverings.
1. If style is not indicated, provide extruded aluminum frame both sides, resilient seals, and minimize exposed metal.

C. Resilient Seal Type Covers: Having flat exposed surface without crevices that could collect dirt; designed to withstand expected movement without extrusion of seal from joint assembly; for floors, provide style that is flush with top of floor covering; for exterior joints, weathertight.

D. Sliding Cover Plate Type Covers: Provide plate with beveled edges and neat fit that does not collect dirt.

E. Covers In Gypsum Board Assemblies: Provide style with anchoring wings that can be completely covered by joint compound.

F. Covers In Fire Rated Assemblies: Provide cover assembly having fire rating equivalent to that of assembly into which it is installed.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper; or ASTM B308/B308M, 6061 alloy, T6 temper.
1. Exposed Finish Outdoors: Natural anodized.
2. Exposed Finish at Floors: Mill finish or natural anodized.

3. Exposed Finish at Walls and Ceilings: Natural anodized.

B. Resilient Seals:
1. For Ceilings: Any resilient material, flush, pleated, or hollow gasket.
2. For Pedestrian Traffic Applications: EPDM rubber, Neoprene, or Santoprene; no PVC; Shore A hardness of 40 to 50 Durometer.
3. For Vehicular Traffic Applications: EPDM rubber, Neoprene, or Santoprene; no PVC; Shore A hardness of 40 to 50 Durometer.

C. Anchors and Fasteners: As recommended by cover manufacturer.

D. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.

E. Threaded Fasteners: Aluminum.

F. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.

3.02 INSTALLATION

A. Install components and accessories in accordance with manufacturer's instructions.

B. Align work plumb and level, flush with adjacent surfaces.

C. Rigidly anchor to substrate to prevent misalignment.

3.03 PROTECTION

A. Do not permit traffic over unprotected floor joint surfaces.

B. Provide strippable coating to protect finish surface.

END OF SECTION 07 95 13

SECTION 08 11 13
OLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.
B. Hollow metal frames for wood doors.
C. Fire-rated hollow metal doors and frames.
D. Thermally insulated hollow metal doors with frames.
E. Commercial security hollow metal doors and frames.
F. Hurricane-resistant hollow metal doors and frames.
G. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.
B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
C. Section 09 91 13 - Exterior Painting: Field painting.
D. Section 09 91 23 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2018.
C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames 2015.
D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.
E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.
F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
J. ASTM C476 - Standard Specification for Grout for Masonry 2020.
K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014 (Reapproved 2021).
L. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames 2016.
M. FBC TAS 201 - Impact Test Procedures; Testing Application Standard 1994.
N. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard 1994.
O. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard 1994.

P. FLA (PAD) - Florida Building Code Online - Product Approval Directory Current Edition.

Q. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

R. ITS (DIR) - Directory of Listed Products current edition.

S. Miami (APD) - Approved Products Directory; Miami-Dade County Current Edition.

T. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

U. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

V. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2007.

W. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

X. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

Y. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

Z. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2013.

AA. UL (DIR) - Online Certifications Directory Current Edition.

BB. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Design Submittals: Manufacturer to submit anchor design analysis calculations for blast-resistant doors signed and sealed by specialty design engineer experienced in this type of work and licensed in Florida.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND ANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Fleming Door Products, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   5. Steelcraft, an Allegion brand: www.allegion.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 OLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
   2. Door Thickness: 1-3/4 inches, nominal.

B. Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
   2. Door Thickness: 1-3/4 inches, nominal.

C. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.

b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.

2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   a. Attach fire rating label to each fire rated unit.
4. Door Thickness: 1-3/4 inches, nominal.

D. Hurricane-Resistant Doors:
1. Comply with Florida Building Code (FBC) test protocols for High Velocity Hurricane Zone (HVHZ) FBC TAS 201, FBC TAS 202 and FBC TAS 203.
2. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
   a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
   b. Wind-Borne Debris Resistance: Door and frame components shall have FLA (PAD) approval or Miami (APD) approval for Large and Small Missile impact and pressure cycling at design wind loads.
3. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 3 - Extra Heavy-duty.
   b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
4. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
5. Door Thickness: 1-3/4 inches, nominal.

2.04 OLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Knock-down type.
1. Weatherstripping: Separate, see Section 08 71 00.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
2. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.

E. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.
2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
3. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.

F. Hurricane-Resistant Door Frames: With same hurricane resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
1. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
2. Stainless-Steel Finish: Same as stainless-steel door finish.

G. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

H. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINIS ES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
   1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
   2. Style: Standard straight slat blade.
   3. Fasteners: Concealed fasteners.

B. Glazing: As specified in Section 08 80 00, factory installed.

C. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Install door hardware as specified in Section 08 71 00.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Comply with glazing installation requirements of Section 08 80 00.

G. Coordinate installation of electrical connections to electrical hardware items.

H. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 AD USTING

A. Adjust for smooth and balanced door movement.

END OF SECTION 08 11 13

SECTION 08 17 00
INTEGRATED DOOR OPENING ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory-assembled and factory-finished hollow metal doors and frames, including hardware for door opening assemblies.

1.02 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames 2019.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

E. BHMA A156.3 - American National Standard for Exit Devices 2014.

F. BHMA A156.4 - American National Standard for Door Controls - Closers 2013.

G. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks 2014.

H. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000 2017.

I. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical 2015.

J. BHMA A156.18 - American National Standard for Materials and Finishes 2016.

K. BHMA A156.26 - American National Standard for Continuous Hinges 2017.

L. BHMA A156.30 - American National Standard for High Security Cylinders 2014.

M. BHMA A156.32 - American National Standard for Integrated Door Opening Assemblies 2014.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

Q. UL (DIR) - Online Certifications Directory Current Edition.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Indicate details of each opening showing elevations, glazing, frame profiles, hardware, and different finish locations, if any.

D. Samples: Submit two samples of exposed door finish materials, in manufacturer's standard sizes, showing factory finishes and colors as selected.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND ANDLING

A. Deliver units preassembled and prefinished, with door hardware mounted and functioning, and packaged to protect contents from damage.
   1. Supply double door units without prehung doors, unless otherwise indicated.

B. Store in a clean, dry, and ventilated space having controlled temperature and relative humidity between 30 and 60 percent and in accordance with manufacturer's written instructions.

C. Stack doors flat and off the floor to prevent warping.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide manufacturer's standard warranty against defects in material and workmanship:
   1. For entire door opening assembly, provide five year warranty period after Date of Substantial Completion.
   2. Warranty shall be void unless units are stored in accordance with manufacturer's instructions prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design - Integrated Door Opening Assemblies:
   1. Syntegra Door Systems; Door Systems, Inc. Distributor: www.doorsysinc.com/#sle.

B. Other Acceptable Integrated Door Opening Assemblies Manufacturers:
   1. Adams Rite - The Rite Door, an Assa Abloy Group company: www.ritedoor.com/#sle.
   2. Total Door Systems: www.totaldoor.com/#sle.

C. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ASSEMBLIES

A. Door, Frame, and Hardware Assemblies: Provide fully functional, factory-assembled and factory-finished door opening units, complete with door, frame, and hardware; complying with BHMA A156.32 and specified requirements.
   1. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Applications:
   1. Door opening assemblies include elevator lobby and stairwell as indicated on drawings.
      a. Provide double door openings as indicated on drawings.
      b. Provide independent latching pairs.

C. Electric Operated Doors:
   1. Operation: Fail Secure (locked when power is removed), relative to secure side.

2.03 PERFORMANCE REQUIREMENTS

A. Comply with requirements of local building code and authorities having jurisdiction, and the following:
   1. Force to Open Interior Swinging Egress Doors, Non-Fire Doors: Not more than 5 lb.
   2. Force to Release Latch for Other Swinging Doors: Not more than 15 lb to release latch, not more than 30 lb to set door in motion, and not more than 15 lb to swing door to full open position.
   3. Fire-Rated Doors: Comply with NFPA 80 and NFPA 252.
      a. Hourly Fire-Rating: 90-minute.
   4. Temperature Rise Across Fire Doors in Interior Exit Stairways: Maximum of 250 degrees F above ambient at end of 30 minutes standard fire test exposure.
   5. Provide fire-rated units listed and labeled by UL (DIR).

a. Attach fire rating label to each fire-rated unit in compliance with NFPA 80.

2.04 COMPONENTS

A. Hollow Metal Doors: Doors complying with ANSI/SDI A250.8 construction requirements exceeding Level 3 and Physical Performance Level A, Model 1 - Full Flush; electrogalvanized prior to finishing; manufacturer's standard core and reinforcements.
   1. Door Thickness: 1-3/4 inches.
   2. Fire-Rated Doors: 16 gauge, 0.053 inch thick faces and edges.

B. Hollow Metal Door Frames: Formed steel cased opening complying with ANSI/SDI A250.8 construction requirements exceeding Level 3 and Physical Performance Level A; electrogalvanized prior to finishing.
   1. Type: Full profile welded, 16 gauge, 0.053 inch, primed for field finishing.
   2. Provide frame anchors for secure installation and to comply with opening performance requirements.

2.05 DOOR ARDWARE

A. Manufacturers: Door hardware manufacturers are as determined by manufacturer of Integrated Door Opening Assemblies in compliance with BHMA A156.32 requirements for applications indicated.

B. Continuous Hinges: Full height; complying with BHMA A156.26, Grade 1.
   1. Type: Pin and barrel.
   2. Base Metal: Aluminum.
   3. Finish: As selected by Architect.

C. Mortise Locks: Complying with BHMA A156.13, Grade 1.
   1. Locking Functions: Provide to suit door occupancy, and selected from door manufacturer's standard functions.

D. Lock Cylinders: Provide standard type cylinders, with six-pin core in compliance with BHMA A156.5, Grade 1, at locations indicated.
   1. Provide key access on outside of each lock, unless otherwise indicated.
   2. Provide high security mechanical type cylinders, with six-pin core in compliance with BHMA A156.30, Grade 1, at locations indicated.
   3. Provide cylinders from same manufacturer as locking device.
   4. Provide cams and/or tailpieces as required for locking devices.

E. Concealed Pocket Door Closers: Provide concealed wall mounted pocket door closer with cover, 180 degree swing, positive stop, adjustable sizing, latching, and closing speed; complying with BHMA A156.4, Grade 1.
   1. Normally Open Doors: Provide concealed closer and arm, when door is open.
   2. Provide for fire-rated integrated doors and other doors as indicated in schedule.

F. Flush Panic Exit Devices: Provide flush panel exit device, recessed into door; extruded aluminum, natural anodized finish; complying with BHMA A156.3, Grade 1.
   1. Projection From Face of Door: Maximum of 3/16 inch when door is open, minimum of 1-1/8 inch when closed.
   2. Face Insert: To match door finish.

G. Door Pulls, Lever Handle Trim: Provide lever handle trim to operate locksets or latchsets; lever design selected from door manufacturer's full line; rectangular escutcheon.
   1. Material: Stainless steel.
   2. Finish: Satin.
   3. Style: As selected by Architect.

H. Electromagnetic Door Holders: Complying with BHMA A156.15.
   1. Size, Round: 1-3/8 inches in diameter, with 1/8 inch projection.
   2. Holding Force: 40 lbf.
   3. Voltage: 12 VDC.

2.06 FINIS ES

A. Doors and Frames:
   1. Primed Frames: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
   2. Primed Doors: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
   3. Door Factory Finish: Complying with ANSI/SDI A250.3, door manufacturer's standard coating.
      a. Color: As selected by Architect from manufacturer's standard range.
   4. Applied Vinyl: As selected by Architect from manufacturer's standard list.

B. Door Hardware: Provide door hardware of same finish, unless otherwise indicated.
   1. Finish: 630; satin stainless steel, with stainless steel 300 series base material (former US equivalent US32D); BHMA A156.18.

2.07 ACCESSORIES

A. Frame Spreader Bar: Provide for preassembled welded frames, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this Work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's requirements and the specified performance requirements.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Coordinate installation of electrical connections to electrical hardware items.

E. Touch up damaged factory finishes.

3.03 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI/SDI A250.8.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 AD USTING

A. Adjust for smooth and balanced door movement.

ARDWARE SET - CROSS CORRIDOR, SAME SWING PAIRS, ELECTRIFIED EXIT DEVICE, AUTOMATIC OPERATOR

Provide the following for each Pair (PR) doors.

UNITS	ITEM	DESCRIPTION	FINISH	MFR
2 Each	CONT. HINGE, EDGE MOUNT	EM	630	SYN
2 Each	ELECTRIFIED EXIT DEVICE X LEVER (Always Locked)	XT-LC-ML	630	SYN
2 Each	MORTISE CYLINDER			By Others
1 Each	AUTO OPERATOR			By Others
1 Set	SMOKE SEAL	SS	DBZ	SYN
2 Each	KICK PLATE	KP	630	SYN
1 Each	WIRE TRANSFER	EPT-EM-105		SYN
1 Each	POWER SUPPLY	PS-1		SYN

END OF SECTION 08 17 00

SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Infill panels of metal and glass.

C. Aluminum doors and frames.

D. Weatherstripping.

1.02 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Steel attachment members.

B. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

C. Section 08 44 13 - Glazed Aluminum Curtain Walls.

D. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

E. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site 2015.

B. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems 2014.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.

F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

M. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.

N. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014 (Reapproved 2021).

O. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

P. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure

Difference 2015.

Q. FLA (PAD) - Florida Building Code Online - Product Approval Directory Current Edition.

R. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
   1. Structural component details are to be signed and stamped by a registered engineer licensed in the State of Florida.

D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

H. Designer's Qualification Statement.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Florida.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.

1.07 DELIVERY, STORAGE, AND ANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum-Framed Storefronts Manufacturers:
   1. Coral Architectural Products, a division of Coral Industries, Inc; FL550: www.coralap.com/#sle.
   2. Kawneer North America; IR 501: www.kawneer.com/#sle.
   3. Tubelite, Inc; E/T34000: www.tubeliteinc.com/#sle.
   4. YKK AP America, Inc.; YHS 50 FS: www.ykkap.com.

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Wind-Borne-Debris Resistance Tested:
   1. Basis of Design: Coral Architectural Products, a division of Coral Industries, Inc; Series FL550: www.coralap.com/#sle.
   2. Vertical Mullion Dimensions: 2-1/2 inches wide by 5 inches deep.

2.03 BASIS OF DESIGN -- SWINGING DOORS

A. Wind-Borne-Debris Resistance Tested:
   1. Basis of Design: Coral Architectural Products, a division of Coral Industries, Inc; MS381, medium stile, monolithic glazing: www.coralap.com/#sle.
   2. Thickness: 1-3/4 inches.

2.04 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Unitized, shop assembly.
   2. Glazing Rabbet: For 1 inch insulating glazing.
   3. Finish: Superior performing organic coatings.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   4. Finish Color: As selected by Architect from manufacturer's standard line.
   5. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without

causing detrimental effect to system components, anchorages, and other building elements.

9. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
11. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.

B. Performance Requirements
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   a. Positive Design Wind Load: 79 lbf/sq ft.
   b. Negative Design Wind Load: -106 lbf/sq ft.
   c. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Florida Building Code FLA (PAD) approval for Large and Small Missile impact and pressure cycling at design wind pressure.
3. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
4. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
5. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.

2.05 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Glazing Stops: Flush.
2. Cross-Section: 2-1/2 by 2-1/2 inch nominal dimension.

B. Glazing: As specified in Section 08 80 00.

C. Swing Doors: Glazed aluminum.
1. Thickness: 1-3/4 inches.
2. Top Rail: 4 inches wide.
3. Vertical Stiles: 3-3/4 inches wide.
4. Bottom Rail: 7-1/2 inches wide.
5. Glazing Stops: Square.
6. Finish: Same as storefront.

D. Sun Screens: Shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance.
1. Configuration: As indicated on drawings.
2. Louver Type: Bar.
3. Sun Screen Angle: 90 degrees from horizontal.
4. Outrigger Shape: Straight.
5. Design Criteria: Design and fabricate to resist the same loads as storefront system as well as the following loads without failure, damage, or permanent deflection:
   a. Live: [___] psf; minimum.
   b. Thermal Movement: Plus/minus 1/8 inch, maximum.
6. Sizes: As indicated on drawings.

2.06 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.

E. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.

F. Fasteners: Stainless steel.

G. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.

H. Concealed Flashings: Galvanized steel, 26 gauge, 0.0179 inch minimum base metal thickness.

I. Sealant for Setting Thresholds: Non-curing butyl type.

J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

K. Glazing Accessories: As specified in Section 08 80 00.

L. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

M. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.07 FINIS ES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch.

C. Color: As selected by Architect from manufacturer's standard range.

D. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.08 ARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Other Door Hardware: As specified in Section 08 71 00.

C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. Provide services of storefront manufacturer's field representative to observe for proper installation of system and submit report.

B. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf.
      a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.

C. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 AD USTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 43 13

SECTION 08 71 00
FINIS ARDWARE

PART I - GENERAL

1.01 WORK INCLUDED

A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

1.02 RELATED WORK SPECIFIED ELSEW ERE

A. Casework, Millwork, Cabinets

B. Hollow Metal Doors and Frames

C. Aluminum Doors and Frames

D. Wood Doors

1.03 DESCRIPTION OF WORK

A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.

B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.

C. All hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.

1.04 FIRE-RATED OPENINGS

A. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80, NFPA Standards NO. 101, UBC 702 (1997) and UL10C. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required and complies with the requirements of the door and door frame labels.

B. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating “Fire Exit Hardware”.

1.05 FASTENERS

A. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.

B. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.

C. Insofar as practical, furnished concealed type fasteners for hardware units that have exposed screws shall be furnished with Phillips flat head screws, finished to match adjacent hardware.

D. Door closers and exit devices to be installed with closed head through bolts (sex bolts).

1.06 QUALITY ASSURANCE

A. The supplier to be a directly franchised distributor of the products to be furnished and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and the general contractor at reasonable times during the course of work.

B. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.

C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.

D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.

E. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.

F. The hardware manufactures are to supply both a pre-installation class as well as a post-installation walk thru. This is to ensure proper installation and provide for any adjustments or replacements of hardware as required.

1.07 DELIVERY, STORAGE, AND ANDLING

A. Wrap and protect finishing hardware items for shipment. Deliver to manufacturing contractor's hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.08 WARRANTY

A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer's warranty permits.

B. Overhead door closers shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner.

1.09 MAINTENANCE MATERIALS

A. Furnish the following for Owner's use in maintenance of project.
1. Locks and Latches: One (1) of each type.
2. Panic Bars: One (1) of each type.
3. Closers: One (1) of each type.
4. Stops: One (1) of each type.

PART II - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. To the greatest extent possible, obtain each kind of hardware from only one manufacturer.

B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
1) INGES	IVES	AGER, STANLEY
2) LOCKS LATC ES	SC LAGE	NONE OWNERS STANDARD
3) CABINET LOCKS	SC LAGE	NONE OWNERS STANDARD
4) CYLINDERS, KEYS, KEYING	SC LAGE	NONE OWNERS STANDARD
5) EXIT DEVICES	VON DUPRIN	NONE OWNERS STANDARD
6) DOOR CLOSERS	LCN	NONE OWNERS STANDARD
7) O STOPS OLDERS	GLYNN O NSON	RIXSON
8) MAGNETIC OLD OPENS	LCN	RIXSON
9) WALL STOPS FLOOR STOPS, FLUS BOLTS	IVES	ROCKWOOD
10) KICK PLATES	IVES	ROCKWOOD

11) **T RES OLD WEAT ER-STRIP ZERO PEMKO, NATIONAL GUARD**
12) **SILENCERS IVES ROCKWOOD**

C. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. These products are specified with the notation: “Owners Standard”.

2.02 FINIS OF ARDWARE

A. Exterior Hinges to be Stainless Steel (630/32D), Interior Hinges to be Satin Chrome (652/26D). Door Closers to be Aluminum 689. Cylindrical locks to be Satin Chrome (626/26D) and Exit Devices to be Satin Chrome/Stainless Steel (626/26D – 630/32D) as listed. Overhead Holders to be Stainless Steel (630/32D), Flat Goods to be Stainless Steel (630/32D) or Satin Chrome (626/26D) as listed and the Thresholds to be Mill Finish Aluminum.

2.03 INGES AND PIVOTS

A. Exterior butts shall be furnished with non-removable pins (NRP).

B. Interior butts shall be as listed.

C. Doors 5’ or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2’6” in height or fraction thereof. Dutch door shall have two (2) butts per leaf. Doors 3’6” and over to have heavy weight hinges.

2.04 KEYING

A. All locks and cylinders shall be furnished with full size removable cores with Everest Patented Restricted T keyway by Schlage Lock Company. All new bittings and keying shall be completed at the factory in order to maintain the integrity of the existing grand master key system

B. Existing projects – Furnish cylinders compatible with existing key system – verify with Owner

C. All locks and cylinders to be furnished with full size construction cores. The contractor is to change out the temporary cores for the permanent cores.in accordance with the Owners instructions. Furnish two (2) ea. Construction Control keys, six (6) each Construction Master Keys and ten (10) ea. Construction Change keys.

D. Provide Three (3) each change keys per lock and Six (6) each grand master and master keys. Stamp “DO NOT DUPLICATE”.

E. Pre-Order Meeting: General Contractor shall coordinate a Keying meeting with the Owner, Architect, Hardware Supplier and all other parties as necessary within 10 working days after award of the Hardware contract. Hardware Supplier shall produce a Keying Schedule for approval incorporating all the Owners instructions. Deliver all final keys and construction key voiding devices to Owner by security shipment direct from the hardware supplier.

F. Supply and deliver two (2) copies of the factory key bitting schedules to the Owner in conjunction with the delivery of the final keys.

2.05 LOCKSETS

A. Cylindrical Locks - ANSI A156.2 Series 4000, Grade 1 Strength and Operational requirements. Meets A117.1 Accessibility Codes. Latch bolts shall be steel with minimum 1/2” throw, deadlocking on keyed and exterior functions. 3/4” throw anti-friction latchbolt on pairs of fire doors. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame. Locksets to be tested to exceed 3,000,000 cycles. Lock case shall be steel. Lock shall incorporate one-piece spring cage and spindle. Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Provide Seven Year Warranty.
   1. Lock design shall be Schlage ND series “RHO” design.

B. Mortise Locks – ANSI A156.13 Series 1000, Grade 1 Operational and Security, UL listed for 3-hour fire door. With Interchangeable core cylinders: Grade 2 Security. Levers shall be forged brass, bronze, or cast stainless steel. Steel Case with 3/4” throw stainless steel anti-friction latchbolt and a 1” throw stainless steel deadbolt. Lock case shall be field reversible, without

opening the lock chassis and universal chassis to accept both knob and lever functions. Lock trim shall incorporate individual lever support springs in each rose or escutcheon. Lever connection by attaching threaded bushings tightened by a spanner wrench. Threaded set screws will not be accepted. Lock spindles shall be two independent inside and outside spindles to prevent manipulation of lock. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame.

1. Lock design shall be Schlage L9000 series 06A design.

C. Cabinet Locks, CL100 or CL200 as manufactured by Schlage Lock Company.

D. Stand-alone access locks to be Schlage CO100 series.

2.06 EXIT DEVICES

A. All devices shall be Von Duprin 98 series in types and functions specified. All devices must be listed under “Panic Hardware” in accident equipment list of Underwriters Laboratories. All labeled doors with “Fire Exit Hardware” must have labels attached and be in strict accordance with Underwriters Laboratories.

2.07 DOOR CLOSERS

A. All closers shall be LCN 4040XP series having non-ferrous covers, forged steel arms separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated.

B. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.

C. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C.

D. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.

2.08 TRIM AND PLATES

A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 32D finish. Kick plates to be 10” high, mop plates to be 4” high. Plates shall be two (2) inches less full width of door on single doors and (1) inch less full width of door on pairs of doors.

B. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

2.09 DOOR STOPS

A. Doorstops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Ives WS407 series are preferred, but where not practical furnish floor stops equal to Ives FS446 or FS448 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson 900 series on exterior and 450 series on interior.

2.10 T RES OLDS AND WEAT ERSTRIP

A. Thresholds and weatherstrip shall be as listed in the hardware schedule.

2.11 DOOR SILENCERS

A. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

PART III - EXECUTION

3.01 INSTALLATION

A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.

B. Contractor to provide a secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items that are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.

C. No hardware is to be installed until the hardware manufactures have provided a pre-installation class. This is to insure proper installation of the specified products.

3.02 AD USTING AND CLEANING

A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

3.03 PROTECTION

A. Contractor shall protect the hardware, as it is stored on construction site in a covered and dry place.

B. Contractor shall protect exposed hardware installed on doors during the construction phase.

3.04 KEY CABINET

A. Set up and index one (1) Key Cabinet that allows room for expansion for 150% of the number of keys for the project.

3.05 ARDWARE SC EDULE

A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors or for each single door.

B. This hardware schedule was prepared by.

ALLEGION, PLC

3451 TEC NOLOGICAL AVE, SUITE 7

ORLANDO FL 32817

P 407-571-2000

FAX 407-571-2006

END OF SECTION 08 71 00

HARDWARE SCHEDULE:

A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors; or for each single door.
B. This hardware schedule prepared by.

Allegion, PLC
3451 Technological Ave, Suite 7
Orlando FL 32817
Ph: 407-571-2000
Fax 407-571-2006

HARDWARE GROUP NO. 01 - EXTERIOR STOREFRONT - PAIR

101A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CYLINDER	PROVIDE CYLINDER(S) TO MATCH BUILDINGS MASTERKEY SYSTEM	626	FAL

ALL HARDWARE BY STOREFRONT SUPPLIER.
HARDWARE TO BE FBC NOA COMPLIANT

HARDWARE GROUP NO. 02 - EXTERIOR STOREFRONT - SGL

100A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CYLINDER	PROVIDE CYLINDER(S) TO MATCH BUILDINGS MASTERKEY SYSTEM	626	FAL

ALL HARDWARE BY STOREFRONT SUPPLIER.
HARDWARE TO BE FBC NOA COMPLIANT

HARDWARE GROUP NO. 03 - EXTERIOR STAIRWELL
001B 100B
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	HH-25-R-L-NL-DANE-299F-SNB	626	FAL
1	EA	MORTISE CYLINDER	986 OBV	626	FAL
1	EA	SURFACE CLOSER	SC71A DS	689	FAL
1	EA	RAIN DRIP	11A	A	ZER
1	SET	GASKETING	139A-S	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

FBC NOA FL-12400 BASIS OF DESIGN

HARDWARE GROUP NO. 04 - EXTERIOR TRASH ENCLOSURE
107
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN	626	FAL
1	EA	SURFACE CLOSER	SC71A DS	689	FAL
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

FBC NOA FL-12400 BASIS OF DESIGN

HARDWARE GROUP NO. 05 - INATERIOR STAIRWELLS
001A 001C 001D
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	F-25-R-L-BE-DANE-SNB	626	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	689	FAL
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 06 - SUITE ENTRY/MECH/CUSTODIAL/STORAGE

101B 104 105 106 201 204 205

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	B581CP6 DAN	626	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	689	FAL
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE GROUP NO. 07 - RESTROOMS

102 103 202 203

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	MA311 OCCUPIED/VACANT DGM	626	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	689	FAL
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

D. Section 08 44 13 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).

D. ASTM C1036 - Standard Specification for Flat Glass 2021.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2019.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2021a.

I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings 2016.

J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.

K. GANA (GM) - GANA Glazing Manual 2008.

L. GANA (SM) - GANA Sealant Manual 2008.

M. GANA (LGRM) - Laminated Glazing Reference Manual 2009.

N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).

O. NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2014, with Errata (2017).

Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

C. Samples: Submit two samples 4 by 4 inch in size of glass units.

D. Certificate: Certify that products of this section meet or exceed specified requirements.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Insulating Glass Units: One of each glass size and each glass type.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.
      b. Equivalent independent third-party ANSI accredited certification.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 MOCK-UPS

A. Provide on-site glazing mock-up with the specified glazing components.

B. Locate where directed.

C. Mock-ups may remain as part of the Work.

1.08 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

D. Heat Soaked Tempered Glass: Provide a five (5) year manufacturer warranty to include coverage for spontaneous breakage of fully tempered glass caused by nickel sulfide (NiS) inclusions.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure:
      a. Positive Design Pressure: 79 psf.
      b. Negative Design Pressure: -106 psf.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   4. Glass thicknesses listed are minimum.

B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.02 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   5. Heat-Soak Testing (HST): Provide HST of fully tempered glass used on canopy, point-supported, spider wall, high-risk, sloping overhead, horizontal overhead, free-standing glass protective barrier, or other demanding applications of project, to reduce risks of spontaneous breakage due to nickel sulfide (NiS) induced fractures in accordance with industry established testing requirements.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

2.03 INSULATING GLASS UNITS

A. Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   3. Warm-Edge Spacers: Polypropylene warm-edge technology design.
      a. Spacer Width: As required for specified insulating glass unit.
      b. Spacer Height: Manufacturer's standard.
   4. Spacer Color: Black.
   5. Edge Seal:
      a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.

b. Color: Black.
6. Purge interpane space with dry air, hermetically sealed.

B. Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Gray.
b. Coating: Self-cleaning type, on #1 surface.
c. Coating: Low-E (passive type), on #2 surface.
4. Warm-edge spacer.
5. Inboard Lite: Laminated float glass, 1/4 inch thick, minimum.
a. Tint: Clear.
6. Total Thickness: 1 inch.
7. Thermal Transmittance (U-Value): 0.57, maximum.
8. Visible Light Transmittance (VLT): 30 percent, nominal.
9. Solar Heat Gain Coefficient (SHGC): 0.25, maximum.

C. Insulating Glass Units: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Gray.
b. Coating: Same as on vision units, on #2 surface.
4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick.
a. Tint: Clear.
b. Opacifier: Ceramic frit, on #4 surface.
1) Opacifier Color: Medium Gray.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value): 0.57, maximum.

2.04 GLAZING UNITS

A. Monolithic Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
2. Glass Type: Annealed float glass.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.

B. Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
a. Glazed lites in doors, except fire doors.
b. Glazed sidelights to doors, except in fire-rated walls and partitions.
c. Other locations required by applicable federal, state, and local codes and regulations.
d. Other locations indicated on drawings.
2. Glass Type: Fully tempered safety glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.

2.05 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured

Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

C. Verify that sealing between joints of glass framing members has been completed effectively.

D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - PLASTIC FILM

A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

B. Place without air bubbles, creases or visible distortion.

C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required. Do not score the glass.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 80 00

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Carpet tile.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Patching compound.

F. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.

B. Section 03 30 00 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

C. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.

D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens) 2021.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete 2020.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2021.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

B. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.

C. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Product data for recommended remedial coating.
   7. Include certification of accuracy by authorized official of testing agency.
   8. Submit report to Architect.
   9. Submit report not more than two business days after conclusion of testing.

D. Adhesive Bond and Compatibility Test Report.

E. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.
   5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any

recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Use product recommended by testing agency.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Specified remediation, if required.
   6. Patching, smoothing, and leveling, as required.
   7. Other preparation specified.
   8. Adhesive bond and compatibility test.
   9. Protection.

B. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
   3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
   1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
   2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
   3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.09 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 09 05 61

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Acoustic insulation.

E. Cementitious backing board.

F. Gypsum wallboard.

G. Joint treatment and accessories.

H. Textured finish system.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

C. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.

D. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

E. Section 09 30 00 - Tiling: Tile backing board.

F. Section 31 31 16 - Termite Control: Field-applied termiticide and mildewcide for metal framing.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members 2016, with Supplement (2018).

B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.

C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units 1999 (Reaffirmed 2016).

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members 2015.

G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017.

H. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board 2004 (Reapproved 2020).

I. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.

J. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.

K. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.

L. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.

M. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2018.

N. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2020.

O. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.

P. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units 2021.

Q. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

R. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.

S. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

T. ASTM E413 - Classification for Rating Sound Insulation 2016.

U. GA-216 - Application and Finishing of Gypsum Panel Products 2018.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 METAL FRAMING MATERIALS

A. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.

B. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.

C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.

2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
5. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

D. Non-structural Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
b. Height: 35-3/4 inches.
3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

E. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.

2.03 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
3. Thickness:
a. Vertical Surfaces: 5/8 inch.
b. Ceilings: 1/2 inch.
c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

B. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
a. Thickness: 1/2 inch.

C. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: 1/2 inch.
3. Edges: Tapered.

2.04 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3-1/2 inch.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

D. Decorative Metal Trim:
   1. Material: Extruded aluminum alloy 6063-T5 temper.
   2. Finish: Anodized, clear.
   3. Type: Profile as selected from manufacturer's standard range.

E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners.
   2. Joint Compound: Setting type, field-mixed.

F. Finishing Compound: Surface coat and primer, takes the place of skim coating.

G. Textured Finish Materials: Latex-based compound; plain.

H. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

I. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

J. Nails for Attachment to Wood Members: ASTM C514.

K. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
   1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
   2. Install studs at spacing required to meet performance requirements.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
   1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
   2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

G. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:
   1. Single-Layer Applications: Screw attachment.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

3.07 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   3. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling, and sanding are not required at base layer of double-layer applications.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.08 TEXTURE FINISH

A. Apply finish texture coating by means of trowel in accordance with manufacturer's instructions.

B. Texture Required: Knockdown.

3.09 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09 21 16

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Tile for shower receptors.

D. Cementitious backer board as tile substrate.

E. Stone thresholds.

F. Ceramic trim.

G. Non-ceramic trim.

1.02 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017.

B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.

C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 1999 (Reaffirmed 2021).

D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship 2019.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive 2019.

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 2020.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy 1999 (Reaffirmed 2019).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2019).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2019).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017.

K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.

L. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2019).

M. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2021).

N. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar 2020.

O. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2012 (Revised).

P. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation 2010 (Reaffirmed 2016).

Q. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units 1999 (Reaffirmed 2016).

R. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation 2014.

S. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation 2014.

T. ANSI A137.1 - American National Standard Specifications for Ceramic Tile 2021.

U. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products 2018.

V. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2021.

W. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.

X. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.

Y. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2019.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.

D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Installer's Qualification Statement:
   1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation.

G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Tile: 3 percent of each size, color, and surface finish combination.
   3. Extra Grout: 5% of each color.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.
      a. Accredited Five-Star member of the National Tile Contractors Association (NTCA) or Trowel of Excellence member of the Tile Contractors' Association of America (TCAA).

1.06 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up where indicated on drawings, incorporating all components specified for the location.
   1. Minimum size of mock-up is indicated on drawings.
   2. Approved mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. Porcelain Tile: ANSI A137.1 standard grade.
   1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
   2. Thickness: 3/8 inch.
   3. Edges: Cushioned.
   4. Surface Finish: Unglazed.
   5. Color(s): As indicated on drawings.

2.02 TRIM AND ACCESSORIES

A. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
   1. Applications:
      a. Open Edges: Bullnose.
      b. Inside Corners: Jointed.
      c. Floor to Wall Joints: Cove base.
   2. Manufacturers: Same as for tile.

B. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. Open edges of wall tile.
      b. Open edges of floor tile.
      c. Wall corners, outside and inside.
      d. Transition between floor finishes of different heights.
      e. Expansion and control joints, floor and wall.
      f. Floor to wall joints.
      g. Borders and other trim as indicated on drawings.

C. Thresholds: 2 inches wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.
   1. Thickness: 1/2 inch.
   2. Material: Marble, honed finish.
   3. Applications:
      a. At doorways where tile terminates.

2.03 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Products:
      a. ARDEX Engineered Cements; ARDEX X 5: www.ardexamericas.com/#sle.

b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
c. LATICRETE International, Inc; 257 TITANIUM: www.laticrete.com/#sle.
d. Merkrete, by Parex USA, Inc; Merkrete 735 Premium Flex: www.merkrete.com/#sle.

C. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.

2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As selected by Architect from manufacturer's full line.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
2. Color(s): As selected by Architect from manufacturer's full line.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.

2.06 ACCESSORY MATERIALS

A. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.
2. Fluid or Trowel Applied Type:
a. Material: Synthetic rubber or Acrylic.
b. Thickness: 25 mils, minimum, dry film thickness.

B. Waterproofing Membraneat showers: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Fluid or Trowel Applied Type:
a. Material: Synthetic rubber.
b. Thickness: 25 mils, minimum, dry film thickness.

C. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
1. Test as Follows:
a. Alkalinity (pH): ASTM F710.
b. Internal Relative Humidity: ASTM F2170.

c. Moisture Vapor Emission: ASTM F1869.

2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.19 , manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Install thresholds where indicated.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep control and expansion joints free of mortar, grout, and adhesive.

J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

K. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.

1. Use uncoupling membrane under all tile unless other underlayment is indicated.
2. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.

B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At tiled shower receptors install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.

B. Grout with standard grout as specified above.

3.06 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.07 CLEANING

A. Clean tile and grout surfaces.

3.08 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 30 00

SECTION 09 30 01
TILING

PART 1 - GENERAL

1.1 Qualified Labor (Because tile is a permanent finish, the lowest bid should not be the deciding factor but rather, but who is the most qualified to perform the scope of the work being specified. See TCNA Handbook for a list of recognized programs).

1.2 Pre-Installation Meeting. Field mock-up recommended scaled to appropriate size of the scope of the work 9 sq ft.

1.3 Large format tile is normally considered as tiles with at least one edge 15" in length or greater in combination narrow grout joints may require improvement of the substrate.

PART 2 – PRODUCTS

2.1 Porcelain or ceramic tile shall be of standard/first grade quality as manufactured by Crossville Inc. of Tennessee, and shall conform to requirements of ANSI A-137.1-2021.

Type:	Porcelain tile surface shall be (Insert)
Size:	Porcelain tile shall be manufactured to specific size after firing and shall be Nominal- (Insert) all measurements are in inches unless otherwise specified.
Thickness:	Porcelain tile shall be manufactured to specific thickness after firing and shall be nominal ([8.0 mm or greater] for large unit tile or [6.0 mm or greater] for mosaics).
Color:	Porcelain tile shall be furnished in (Insert Crossville color name and number)
Trim:	According to availability, provide matching trim shapes such as bullnose corners, cove base and borders when specified.

2.2 Setting Materials: Use appropriate installation mortars according to ANSI A118-2021.

2.3 Grouting Materials: Select grouting materials according to the following types: Tile setting and grouting epoxy: A118.6 Standard Cement Grout, A118.7, High Performance Cement Grout or A118.8, Modified Epoxy Emulsion Grout. Provide grout in colors selected by the Architect from standard colors available from the approved manufacturers.

2.4 Waterproofing/Anti Fracture Membrane: Select per ANSI A118.10 as required.

2.5 Jobsite Blending: Blend tiles before installing in accordance with reference standards to produce an even range and distribution of color and finish.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates where tile will be installed for compliance with requirements for installation tolerances and other conditions effecting performance of installed tile. Before tiling concrete surfaces saturated dry (SSD), free of standing water verify that substrates for setting tile are well cured, structurally sound dry, clean, and free from oil or waxy films, curing compounds or other coatings and surface treatments. Nonstructural shrinkage cracks should be pretreated with a crack suppression membrane (to prevent telegraphing of cracks through the finished tile installation) ANSI A118.12.

B. Do not proceed with installation until unsatisfactory conditions have been corrected. Commencement of work signifies acceptance of substrate and installation conditions.

PART 4 - INSTALLATION

4.1 Acceptability of Surfaces

A. Before tiling, verify that all surfaces to be tiled are structurally sound true to plane, and fall within maximum variations shown below:

Walls	Floors
1/4” in 10'*	1/4” in 10’

* When using large format tile, normally considered as tiles with at least one edge 15” in length or greater; a more stringent tolerance 1/8” in 10’ or 1/16” in 24” when measure from the high points on the surface is required.

Report all unacceptable surfaces to the architect in writing, and do not tile such surfaces until they are leveled enough to meet above requirements.

B. Before tiling, all surfaces must be free of curing compounds, oil, grease, wax, dirt, dust, form releases or other substances that would interfere with proper bond of setting materials.

C. Illuminate the work area during installation providing the same level and angle of illumination as will be available for final inspection. The use of grazing or cove type lighting where lights are located either at the wall/ceiling interface, or mounted directly to the wall prompts the light to strike the tile finish at a straight down angle, creating unwanted shadows from grout lines giving the tile layout an un-flat irregular appearance. Installing overhead lighting at a wide downward angle 18”-24” away from the tiled wall, will optimize a flatter more uniform appearance to the tiled surface.

4.2 Setting Methods

Comply with appropriate ANSI A108-2021 specification and current Tile Council of North America Handbook (TCNA) for appropriate method of installation for each specification. For thin set adhesive mortar application use following technique:

- With the flat side of trowel, key mortar into substrate.
- Using the appropriate size trowel, comb mortar in one direction with notched side of the trowel.
- Set tile with a sliding motion, perpendicular to the mortar ridges.
- Obtain as near 100% coverage as possible of mortar to tile.
- Mortar coverage shall be no less than 85% and shall be sufficiently distributed to give full support under all corners and edges of the tile.
- Note: 95-100% coverage is mandatory for wet and exterior areas. Periodically, remove sheets or individual tiles to assure proper bond coverage consistent with industry specifications.

Ensure there is a minimum 1/8" of mortar between tile and substrate after proper bedding. Installer must periodically remove sheets or individual tiles to assure proper bond coverage consistent with industry specifications. If coverage is found to be insufficient, use a larger size notch trowel.

For running bond/brick joint patterns utilizing tiles (square or rectangular) where the side being offset is greater than 18” (nominal dimension), the running bond offset will be a maximum of 33% unless otherwise specified by the tile manufacturer. If an offset greater than 33% is specified, specifier and owner must approve mock-up.

4.3 Expansion Joints

Install architecturally designed expansion joints as per current TCNA Detail EJ171. Prefabricated expansion joint strips can also be used when suitable.

4.4 Grouting Methods

Follow exactly grout manufacturer's instructions and comply with appropriate ANSI A108-2021 specification depending on type of grout selected. Grouting is not complete until all grout haze and residues are removed from the surface of the tile.

4.5 Cleaning and Protection

A. Leave finished installation free of cracked, chipped, broken, un-bonded or otherwise defective tile work.

B. Protect all floor tile installations with clean construction paper or other heavy covering during construction period to prevent staining or damage. No foot or wheel traffic permitted on floor for at least 3 days after grouting. Owner/specifier is responsible for

protecting tile from damage including allowing sufficient time for installed materials to cure properly typically 30-45 days is required for full cure of thin set bonding mortars.

Inquiries – Crossville Incorporated – Technical Services (basis of design)

(931) 484-2110

(931) 484-8418 Fax

E-MAIL crossc@crossvilleinc.com

SECTION 09 50 00
INTEGRATED CEILING ASSEMBLIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.02 SUMMARY

A. Section Includes
   1. Acoustical ceiling panel
      a. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
      b. Perimeter Trim

B. Related Sections
   1. Section 09 51 13 - Acoustical Fabric-Faced Panel Ceilings
   2. Section 09 53 00 - Acoustical Ceiling Suspension Assemblies
   3. Section 09 83 00 – Acoustical Finish
   4. Section 09 20 00 - Plaster and Gypsum Board
   5. Section 09 22 16 - Non-Structural Metal Framing
   6. Section 01 81 13 - Sustainable Design Requirements
   7. Section 01 81 19 - Indoor Air Quality Requirements
   8. Section 02 42 00 - Removal and Salvage of Construction Materials
   9. Divisions 23 - HVAC Air Distribution
   10. Division 26 - Electrical

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
   2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
   3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
   4. ASTM C 645 Standard Specification for Metal Suspension Systems
   5. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
   6. ASTM C754 AND C1858 All installations should be in compliance with these tests.
   7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
   8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
   9. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
   10. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
   11. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation between Rooms Sharing a Common Ceiling Plenum
   12. ASTM E 1264 Classification for Acoustical Ceiling Products
   13. ASTM E3090 All references to suspension component property testing per this test method.

B. International Building Code

C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality

D. NFPA 70 National Electrical Code

E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

1. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
2. International Code Council-Evaluation Services Report - Seismic Engineer Report
   a. 1. ESR 1289 - Armstrong Suspension Systems

1.04 SYSTEM DESCRIPTION

A. Continuous/Wall-to-Wall or Cloud installation

1.05 SUBMITTALS

A. Shop Drawings: Layout and details of ceilings. Show locations of items that are to be coordinated with, or supported by the ceilings.

B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part three, Installation.

C. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.

D. Samples: Minimum 6 x 6 inch samples of specified panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.

E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

F. Non-Conformance: All products not conforming to the requirements of this specification and or the manufacturer's published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.

1.06 SUSTAINABLE MATERIALS

A. Transparency: Manufacturers will be given preference when they provide documentation to support sustainable requirements for the following: Material ingredient transparency, Removal of Red List Ingredients per LBCV3, Life Cycle impact information, Low-Emitting Materials, and Clean Air performance.
   1. Health Product Declaration. The end use product has a published, complete Health Product Declaration with disclosure at a minimum of 1000ppm of known hazards in compliance with the Health Product Declaration open Standard.
   2. Declare Label. The end use product has a published Declare label by the International Living Future Institute with disclosure of 100 ppm with a designation of Red List Free or Compliant (less than 1% proprietary ingredients).
   3. Low Emitting products with VOC emissions data. Preference will also be given to manufacturers that can provide emissions data showing their products meet CDPH Standard Method v1.1 (Section 01350).
   4. Life cycle analysis. Products that have communicated lifecycle data through Environmental Product Declarations (EPDs) will be preferred.
   5. End of Life Programs/Recycling: Where applicable, manufacturers that provide the option for recycling of their products into new products at end-of-life through take-back programs will be preferred.
   6. Products meeting LEED V4 requirements including:
      a. Storage & Collection of Recyclables
      b. Construction and Demolition Waste Management Planning
      c. Building Life-Cycle Impact Reduction
      d. Building Product Disclosure and Optimization Environmental Product Declarations
      e. Building Product Disclosure and Optimization Sourcing of Raw Materials
      f. Building Product Disclosure and Optimization Material Ingredients
      g. Construction and Demolition Waste Management

1.07 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

C. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

D. Acoustical Panels: As with other architectural features located at the ceiling that may obstruct or skew the planned fire sprinkler pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

E. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers. ACOUSTIBuilt Panels are 7/8" thick.

F. Installer Qualification: Subcontractor is an experienced Installer that has reviewed and understands the system installation instructions thoroughly. Subcontractor will follow written installation instructions and utilize approved equipment and procedures for finishing installation.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content. Store all material within temperature limits required by manufacturer.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.09 PROJECT CONDITIONS

A. Space Enclosure:
   1. Building areas to receive ceilings shall be free of construction dust and debris. ACOUSTIBuilt panels should be installed in areas where the building is enclosed and the HVAC is continuously functioning. This product is not recommended for exterior applications, where standing water is present, or where moisture will come into direct contact with the ceiling.
      a. HVAC should be designed, installed, and operated in accordance with ASHRAE Standard 62.1. It is also necessary for the area to be enclosed, for the HVAC systems to be functioning, and in continuous operations for the life of the product. Product is not intended for use where natural ventilation is part of the ventilation strategy and not recommended in areas where a differential plenum pressure exists.

1.10 ALTERNATE CONSTRUCTION WASTE DISPOSAL

A. Reclaimed ceiling material must be kept dry and free from debris.

B. Contact the Armstrong Recycle Center a consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant with provide assistance to facilitate the recycling of the ceiling.

1.11 WARRANTY

A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
   1. Acoustical Panels: Manufacturer's defects in material
   2. Grid System: Rusting and manufacturer's defects

B. Warranty Period:
   1. Acoustical panels: Ten (10) years from date of substantial completion
   2. Suspension: Ten (10) years from date of substantial completion

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.12 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
   1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
   2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design ACOUSTIBuilt:
   1. Armstrong World Industries, Inc.
      a. Finish
         1) Joint Compound Finish by Others
         2) Spray Applied Finish by Armstrong World Industries, Inc.
      b. Suspension Systems and Washers
         1) Armstrong World Industries, Inc.
      c. Perimeter Systems
         1) Armstrong World Industries, Inc.

2.02 ACOUSTICAL CEILING UNITS

A. Acoustical Panels
   1. Surface Texture: Fine
   2. Composition: Mineral Fiber
   3. Color: White (Fine Texture Finish for ACOUSTIBuilt panels)
   4. Size: 48 in x 72 in x 7/8 in - Item #2604
   5. Edge Profile: Tapered edges four sides
   6. Noise Reduction Coefficient (NRC): ASTM C 423; Panel 0.80 (UL)
   7. Ceiling Attenuation Class (CAC): ASTM C 1414; Panel 46 (UL), System up to 48
   8. Sabin: Cloud Applications: 0.80 Sabins/SF & 1.33 Sabins/SF with infill item 8200T10
   9. Articulation Class (AC): ASTM E 1111
   10. Flame Spread: ASTM E 1264; Class A
   11. Light Reflectance (LR) White Panel: ASTM E 1477; 0.87
   12. Dimensional Stability: HumiGuard Plus
   13. Recycle Content: Post-Consumer and Pre-Consumer – up to 75%
   14. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
   15. Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)
   16. Acceptable Product: ACOUSTIBuilt panels #2604 No added formaldehyde as manufactured by Armstrong World Industries
   17. Contact your local Armstrong Representative for required installation training at least 4-6 weeks before ordering materials and scheduling installation.
      a. Finish
         1) Joint Compound
         2) Setting Compound: Lightweight setting-type drywall joint compound, Ultra lightweight drying-type drywall joint compound
         3) Joint Tape: Self-Adhesive mesh drywall joint tape
         4) Spray Applied Finish – Required Product: #2605WH Fine Texture Finish for ACOUSTIBuilt panels – White as manufactured by Armstrong World Industries.
         5) Suspension Systems and Washers

6) Armstrong Drywall Suspension Systems all main beams and cross tees shall be commercial quality hot-dipped galvanized steel
7) Main beam: manufactured main beam- 1-1/2" knurled face with ScrewStop™ reverse hem by 1-11/16 inches high. Drywall Main Beams are factory punched with cross tee routs, hanger wire holes, and SuperLock™ main beam clip for a strong secure connection and fast accurate alignment. Both ShortSpan and Drywall Main Beams are Heavy-duty performance per ASTM C635
8) HD8906 - 12ft HD Drywall Main Beam 1-1/2 in
9) Cross Tees: manufactured cross tee- 1-1/2" knurled face with ScrewStop™ reverse hem by 1-1/2 inches high with factory punched cross tee routs and hanger wire holes and XL stake on clip for a strong secure connection.
10) XL8945P - 4ft Drywall Cross Tee
11) XL8965 – 6ft Drywall Cross Tee
12) Wall Molding:
13) KAM12 - 12ft Knurled Angle Molding 1-1/4" Face
14) Hanger wire: a Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three times the design load, but not less than 12-gauge.
15) Fasteners (for Panel attachment)
16) #6 x 1-5/8” Fine thread or sharp point self-drilling drywall screws
17) Grip-Plate Washer for ACOUSTIBuilt panels (1-1/4”diameter) - #2119
18) Perimeter Systems
19) Commercial quality extruded aluminum alloy 6063 trim channel, factory finished in baked polyester paint. Commercial quality galvanized steel unfinished T-bar connection clips; galvanized steel splice plates.
20) Color: White
21) Size: 120 in X 4 in (also available in 6”)
22) Recycle Content: Post-Consumer - 50% Pre-Consumer - 0%
23) Acceptable Product: AXIOM One Piece for Drywall, 4in Straight – AX1PC4STR or Curved AX1PC4CUR as manufactured by Armstrong World Industries
24) Axiom Trim Channel:
25) AX4STR 4in Axiom Classic Straight
26) AX1PC4STR 4IN One –Piece Drywall Trim
27) Axiom Bottom Trim with taping flange
28) AXBTASTR – Bottom Trim for ACOUSTIBuilt (also available in curved)
29) Axiom Accessories:
30) AXSPLICE - Splice Plate

B. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label

C. Life Cycle Assessment: Third Party Certified Environmental Product Declaration (EPD)

PART 3 - EXECUTION

3.01 PRIOR TO INSTALLATION, CONTACT YOUR ARMSTRONG INSTALLATION SYSTEMS SPECIALIST (ISS). BEFORE INSTALLATION, INSPECT PREVIOUS WORK OF ALL OTHER TRADES. VERIFY THAT ALL WORK IS COMPLETE AND ACCURATE TO THE POINT WHERE THIS INSTALLATION MAY PROPERLY PROCEED IN STRICT ACCORDANCE WITH FRAMING SHOP DRAWINGS.

A. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. The system installation is similar to a conventional drywall installation. However, there are key differences in both material substrate and methods of finishing and installation that make this system unique. Installers should review and follow all written directions of the installation instructions and view the installation video.

C. Installation: In accordance with all approved plans, details, and manufacturer's installation guidelines located in the Armstrong ACOUSTIBuilt Assembly and Installation Instructions, and

Drywall Grid Systems Hanging and Framing Flat Ceilings Installation Guides .

D. Install seismic components if required by the building code. Seismic components to be specified on the architectural plans by the project engineer or design team.

E. Suspend main beam from overhead construction with hanger wires spaced 4-0 ft. or 6-0 ft. on center along the length of the main runner. Install hanger wires plumb and straight.

F. Cross tees shall be installed 16” on center

G. Install wall moldings/perimeter trim at intersection of suspended ceiling and vertical surfaces

H. Main runners and cross tees shall be attached at perimeter conditions

I. When determining the grid layout, consider the long edges of the boards must run parallel with the cross tees.

J. This system relies on a square grid system to ensure panel edges align at centers of cross tees. If the installation does not meet these squareness requirements, the panel edges may run off the grid system.
   1. The system must be square to within 1/8" over a 48" x 48" module.
   2. The suspension system must be leveled to within 1/4" in 10'.
      a. Floating perimeters must be trimmed with either Axiom® One-Piece Drywall Trim or Axiom® Classic with Bottom Trim for ACOUSTIBuilt™. Refer to the installation instructions for integration with ACOUSTIBuilt installations.
      b. 3.2.1 PREPARATION
         1) Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.
         2) Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
         3) Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.
         4) 3.2.3 INSTALLATION

K. Follow manufacturer installation instructions. Armstrong ACOUSTIBuilt Assembly and Installation Instructions

L. Controls joints are required following the standards used for gypsum board listed in ASTM C840, Section 20
   1. Ceilings with perimeter relief cannot exceed 50 LF and 2500 SF between control joints
   2. Ceilings without perimeter relief cannot exceed 30 LF and 900 SF between control joints

M. Panel joints and fasteners are finished with tape and compound to create a flat surface. While the materials used to finish ACOUSTIBuilt panels are also used to finish drywall, the procedure has unique requirements.

N. Joint compound coverage shall be limited to preserve the acoustical performance of the panels. Compound at panel joints shall not exceed 8 inch widths. Compound applied to field fasteners shall not exceed 4 inch by 4-inch areas. All compound shall be smooth and free of tool marks and ridges. Panels are to be finished with taping knives. Production tools, including boxes, are not permitted.

O. Sanding and inspection: Throughout the sanding process, inspect the surface frequently for flatness. Direct a light across the ceiling to highlight unevenness that requires attention.

P. Fine Texture Finish shall be applied in 4 coat process (additional coat may be used to achieve the desired finish) as called out in the installation instructions. Fine Texture Finish for ACOUSTIBuilt is applied in multiple coats, layered to achieve a uniform appearance and acoustical performance. It is strongly encouraged to practice spraying to ensure proper calibration and technique are achieved. Refer to the installation video.
   1. Must be applied with an air assist spray system (refer to manufacturers installation instructions for required equipment). The Fine texture finish is not intended for use with airless spay or to be manually applied by rolling.

2. See Manufactures installation instructions for correct pressure settings for spray system, finish preparation, spray calibration and spray procedure and technique.
   a. 3.2.4 ADJUSTING AND CLEANING
3. To remove soot, dirt, and dust use a vacuum operating at low power with a soft brush or use a dry soot cleaning sponge.
4. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove any ceiling products that cannot be successfully cleaned and or repaired. Replace with attic stock or new product to eliminate evidence of damage.
5. Before disposing of ceilings, contact the Armstrong Recycling Center at 877-276-7876, select option #1 then #8 to review with a consultant the condition and location of building where the ceilings will be removed. The consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant with provide assistance to facilitate the recycle of the ceiling.

END OF SECTION 09 50 00

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method 2017.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2019.

D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2020.

E. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests 2016.

F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples: Submit two full size samples illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, and perimeter molding.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Manufacturer's Qualification Statement.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed each type and size.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. USG Corporation: www.usg.com/ceilings/#sle.
   4. Rockfon, LLC: www.rockfon.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:
   1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.
   1. VOC Content: As specified in Section 01 61 16.

B. Acoustical Panels, Type F: Painted mineral fiber, with the following characteristics:
   1. Classification: ASTM E1264 Type III.
   2. Size: 24 by 24 inches.
   3. Thickness: 3/4 inch.
   4. Panel Edge: Square.
   5. Suspension System: Exposed grid.
   6. Products:
      a. Armstrong World Industries, Inc; Fine Fissured: www.armstrongceilings.com/#sle.
      b. USG Corporation; Astro Acoustical Panels: www.usg.com/ceilings/#sle.

C. Acoustical Panels, Type C & U: Mineral fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type IV.
   2. Size: 24 by 24 inches.
   3. Thickness: 3/4 inch.
   4. Panel Edge: Square.
   5. Suspension System: Exposed grid.
   6. Products:
      a. Armstrong World Industries, Inc; Calla: www.armstrongceilings.com/#sle.
      b. Armstrong World Industries, Inc; Ultima: www.armstrongceilings.com/#sle.
      c. USG Corporation; Mars Acoustical Panels: www.usg.com/ceilings/#sle.

D. Acoustical Panels, Type O: Glass fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type XII.
   2. Size: 24 by 24 inches.
   3. Thickness: 3/4 inch.
   4. Panel Edge: Square.
   5. Suspension System: Exposed.
   6. Products:
      a. Armstrong World Industries, Inc; Optima: www.armstrongceilings.com/#sle.
      b. USG Corporation; Halcyon Acoustical Panels: www.usg.com/ceilings/#sle.

E. Wood Fiber Acoustical Panels, Type [____]: Cementitious wood fiber.
   1. Size: 24 by 24 inches.
   2. Thickness: 1 inch.
   3. Noise Reduction Coefficient (NRC): 0.90 when tested in accordance with ASTM C423 for Type E mounting, per ASTM E795.
   4. Panel Edge: Square.

5. Surface Pattern: Coarse.
6. Surface Color: White.
7. Suspension System: Exposed grid.
8. Products:
   a. Armstrong World Industries, Inc; Tectum: www.armstrongceilings.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

B. Exposed Suspension System: Hot-dipped galvanized steel grid with aluminum cap.
   1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
   2. Profile: Tee; 15/16 inch face width.
   3. Finish: Baked enamel.
   4. Color: White.
   5. Products:
      a. USG Corporation; Donn Brand ZXLA 15/16 inch Acoustical Suspension System: www.usg.com/ceilings/#sle.
      b. Armstrong; Interlude XL 9/16 inch Acoustical Suspension System: www.armstrongceilings.com.

C. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
   1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
   2. Profile: Tee; 9/16 inch face width.
   3. Finish: Baked enamel.
   4. Color: White.
   5. Products:
      a. USG Corporation; Donn Brand Centricitee DXT/DXLT 9/16 inch Acoustical Suspension System: www.usg.com/ceilings/#sle.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.
   1. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
   2. Shadow Molding: Shaped to create a perimeter reveal.
   3. Gaskets For Perimeter Moldings: Closed-cell foam, factory-applied to molding.
   4. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

D. Metal Edge Trim for "Cloud" Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
   1. Trim Height: 6 inch.
   2. Finish: Baked enamel.
   3. Color: White.

E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Form expansion joints as recommended by manufacturer. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 09 51 00

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Static control resilient tile flooring.

C. Resilient base.

D. Resilient stair accessories.

E. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

C. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Grounding and bonding of static control flooring to building grounding system.

1.03 REFERENCE STANDARDS

A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2015).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).

C. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile 2004 (Reapproved 2018).

D. ASTM F1344 - Standard Specification for Rubber Floor Tile 2021a.

E. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.

F. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.

G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2019.

H. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.

D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Flooring Material: 1 Box per 50 Boxes of each type and color.
3. Extra Wall Base: 10 LF per 500 LF of each type and color.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Do not double stack pallets.

1.07 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Tile - Type LVT-1: Solid vinyl with color and pattern throughout thickness.
   1. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.
   4. VOC Content Limits: As specified in Section 01 61 16.
   5. Total Thickness: 0.125 inch.
   6. Color: As indicated on drawings.

B. Rubber Tile - Type RT-1: Heterogeneous, laminated construction.
   1. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. VOC Content Limits: As specified in Section 01 61 16.
   4. Size: 27 by 27 inch nominal.
   5. Total Thickness: 0.125 inch.
   6. Texture: Smooth.
   7. Color: As indicated on drawings.

C. Static Control Tile - Type ESD-1: Homogeneous; color and pattern throughout thickness.
   1. Minimum Requirements: Vinyl composition tile complying with ASTM F1066, Class 2.
   2. Electrical Resistance:
      a. Dissipative Tile: Resistance between 1.0 megohms and 1000 megohms as tested in accordance with ASTM F150.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   4. VOC Content Limits: As specified in Section 01 61 16.
   5. Tile Size: 12 by 12 inch.
   6. Total Thickness: 0.125 inch.

7. Color: As indicated on drawings.

2.02 STAIR COVERING

A. Stair Treads with Integral Risers: Rubber; full height of riser, full width and depth of tread in one piece; tapered thickness.
   1. Minimum Requirements: Comply with ASTM F2169, Type TP, rubber, thermoset.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   3. Nominal Thickness: 080 inch.
   4. Nosing: Square.
   5. Striping: 2 inch wide contrasting color abrasive strips.
   6. Tread Texture: Hammered.
   7. Color: As indicated on drawings.

2.03 RESILIENT BASE

A. Resilient Base - Type WB-2: ASTM F1861, Type TS rubber, vulcanized thermoset; style as scheduled.
   1. Height: 6 inch.
   2. Thickness: 0.125 inch.
   3. Finish: Satin.
   4. Length: Roll.
   5. Color: As indicated on drawings.
   6. Accessories: Premolded external corners and internal corners.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. VOC Content Limits: As specified in Section 01 61 16.

C. Moldings, Transition and Edge Strips: Same material as flooring.

D. Copper Grounding Strips: Type and size as recommended by static control flooring manufacturer.

E. Floor Polish for Static Control Flooring: Fluid-applied polish, intended to protect electrical properties of flooring, as recommended by static control flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 09 05 61.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
   1. Spread only enough adhesive to permit installation of materials before initial set.
   2. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 26 05 26 for grounding and bonding to building grounding system.
   3. Fit joints and butt seams tightly.
   4. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
   2. Resilient Strips: Attach to substrate using adhesive.

F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

G. At movable partitions, install flooring under partitions without interrupting floor pattern.

3.04 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

C. Install square tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

D. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.05 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.06 INSTALLATION - STAIR COVERINGS

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 09 65 00

SECTION 09 90 00
PAINTING AND COATING - COMMERCIAL FACILITY GUIDE SPECIFICATION - SHERWIN-WILLIAMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Concrete: Cementitious siding, Flexboard, Transite, non-roof shingles, common brick, stucco, tilt-up, precast, and poured-in-place cement.
         2) Drywall: Gypsum board and exterior drywall.
      b. Interior:
         1) Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Clean-up information.

C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Applicator's qualification statement.

F. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements for additional provisions.
   2. Extra Paint and Finish Materials: 5% but not less than 1 gallon of each color; from the same product run, store where directed.
   3. Label each container with color in addition to manufacturer's label.

1.03 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.04 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for general requirements for mock-ups.

B. Provide one accent wall as directed by Architect to demonstrate color and finish.

C. Provide door and frame assembly indicating paint color, texture, and finish.

D. Locate where directed by Architect.

E. Mock-up may remain as part of the work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

D. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

1.06 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 60 00 - Product Requirements, and the following:
   1. Products that meet or exceed performance and physical characteristics of basis of design products.

2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.

C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 PAINT SYSTEMS - EXTERIOR

A. Concrete: Cementitious siding, Flexboard, Transite, non-roof shingles, common brick, stucco, tilt-up, precast, and poured-in-place cement.
   1. Latex Systems:
      a. Satin Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer LX02W50: www.sherwin-williams.com/#sle.
            (a) 5.3 to 8 mils wet, 2.1 to 3.2 mils dry.
         2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Exterior Latex Satin, A82 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.

B. Drywall: Gypsum board and exterior drywall.
   1. Latex Systems:
      a. Semi-Gloss Finish:

1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
   (a) 4 mils wet, 1.4 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 series: www.sherwin-williams.com/#sle.
   (a) 2 to 4 mils dry per coat.

2.04 PAINT SYSTEMS - INTERIOR

A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
   1. Latex Systems:
      a. Eg-Shel Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.7 mils dry per coat.

END OF SECTION 09 90 00

SECTION 09 91 13
EXTERIOR PAINTING

PART 2 PRODUCTS

1.01 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

PART 3 EXECUTION

2.01 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

2.02 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance.

D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

END OF SECTION 09 91 13

SECTION 09 91 23
INTERIOR PAINTING

PART 2 PRODUCTS

1.01 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

PART 3 EXECUTION

2.01 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

2.02 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

END OF SECTION 09 91 23

SECTION 09 97 23
CONCRETE AND MASONRY COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Moisture resistant textured concrete and masonry coatings.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus 2019.

B. ASTM D522/D522M - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings 2017 (Reapproved 2021).

C. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive 2017.

D. ASTM D2243 - Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings 1995 (Reapproved 2014).

E. ASTM D6904 - Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied on Masonry 2003 (Reapproved 2013).

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

H. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials 2013 (Reapproved 2021).

I. SSPC-SP 2 - Hand Tool Cleaning 2018.

J. SSPC-SP 3 - Power Tool Cleaning 2018.

K. SSPC-SP 6 - Commercial Blast Cleaning 2007.

L. SSPC-SP 7 - Brush-Off Blast Cleaning 2007.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating coating materials.

C. Samples: Submit two samples 6 by 6 inch in size illustrating colors available for selection.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Maintenance Data: Include cleaning procedures and repair and patching techniques.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document that applies to application on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 MOCK-UP

A. Provide mock-up, 10 feet long by 10 feet wide, illustrating coating, color, and surface sheen, for each specified coating.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 FIELD CONDITIONS

A. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

D. Restrict traffic from area where coating is being applied or is curing.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for bond to substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Concrete and Masonry Coatings:
   1. Sto Corp: www.stocorp.com/#sle.
   2. Textured Coatings of America, Inc: www.texcote.com/#sle.
   3. Substitutions: Section 01 60 00 - Product Requirements.

2.02 CONCRETE AND MASONRY COATINGS

A. Provide high-build, weather resistant coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
   1. Salt Spray Resistance: Passes when tested according to ASTM B117 for 2000 hours.
   2. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
   3. Accelerated Outdoor Exposure: Passes when tested according to ASTM G153 for 5,000 hours.

2.03 MATERIALS

A. Coatings - General: Provide complete systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated.
   1. Maximum volatile organic compound (VOC) content: As required by applicable regulations.

B. High Build, One Coat, Water Based Textured Coating for 'Green' Concrete: Water based, epoxy-acrylic resin with graded perlite aggregate.
   1. Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
   2. Dry Film Thickness: 15 mils, minimum.
   3. Flexibility Test: Passing, when tested according to ASTM D522/D522M with a 1 inch mandrel.
   4. Abrasion Resistance: Passing, when tested according to ASTM D968 with 792 gallons of falling sand.
   5. Freeze Thaw Resistance: Passing, when tested according to ASTM D2243 for 50 cycles.
   6. Wind Driven Rain Resistance: Passing, when tested according to ASTM D6904 at 98 miles per hour for 24 hours.
   7. Water Vapor Transmission: 20 perms, maximum, when tested in accordance with ASTM E96/E96M.
   8. Color: As indicated.
   9. Texture: Fine.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

C. Cementitious Substrates: Do not begin application until substrate has cured 28 days minimum and measured moisture content is not greater than 16 percent.

D. Masonry: Verify masonry joints are struck flush.

3.02 PREPARATION

A. Clean surfaces of loose foreign matter.

B. Remove substances that would bleed through finished coatings.

C. Remove finish hardware, fixture covers, and accessories and store.

D. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent.

E. Ferrous Metal:
   1. Solvent clean.
   2. Remove loose rust, loose mill scale, and other foreign substances using hand tools according to SSPC-SP 2, power tools according to SSPC-SP 3, or blast cleaning according to SSPC-SP 6 or -SP 7.

F. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Concrete and Masonry: Prior to priming, patch holes and indentations and fill cracks with manufacturer's recommended crack repair material.

3.04 COATING APPLICATION

A. Apply coatings in accordance with manufacturer's instructions, to thicknesses specified.

B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished work from damage.

END OF SECTION 09 97 23

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

B. FM (AG) - FM Approval Guide current edition.

C. NFPA 10 - Standard for Portable Fire Extinguishers 2017, with Errata (2018).

D. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
   3. Nystrom, Inc: www.nystrom.com/#sle.
   4. Potter-Roemer: www.potterroemer.com/#sle.

B. Fire Extinguisher Cabinets and Accessories:
   1. Activar Construction Products Group, Inc. - JL Industries; Ambassador Series: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
   3. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.
   4. Nystrom, Inc: www.nystrom.com/#sle.
   5. Potter-Roemer; [_____]: www.potterroemer.com/#sle.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Class: A:B:C type.
   2. Size: 5 pound.
   3. Finish: Baked polyester powder coat, red color.

4. Temperature range: Minus 40 degrees F to 120 degrees F.

C. Carbon Dioxide Type Fire Extinguishers: Aluminum tank, with pressure gauge.
1. Class: B:C type.
2. Size: 5 pound.
3. Finish: Baked polyester powder coat, red color.
4. Temperature range: Minus 40 degrees F to 120 degrees F.

2.03 FIRE EXTINGUISHER CABINETS

A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.

B. Cabinet Construction: Non-fire rated.
1. Formed primed steel sheet; 0.036 inch thick base metal.

C. Fire Rated Cabinet Construction: One-hour fire rated.
1. Steel; double wall or outer and inner boxes with 5/8 inch thick fire barrier material.

D. Cabinet Configuration: Semi-recessed type.
1. Size to accommodate accessories.
2. Projected Trim: Returned to wall surface, with 2 1/2" inch projection, and 13 inch wide face.

E. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.

F. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, full view bubble shape and set in resilient channel glazing gasket.

G. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

H. Fabrication: Weld, fill, and grind components smooth.

I. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Lettering: FIRE EXTINGUISHER decal, or vinyl self-adhering, pre-spaced black lettering in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, 30 inches from finished floor to inside bottom of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

END OF SECTION 10 44 00

SECTION 22 01 00
GENERAL PLUMBING PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE OF DIVISION

A. Work shall include all materials, equipment and labor necessary for a complete and properly functioning plumbing installation in accordance with all applicable codes, and contract drawings and specifications. Work shall include all work specified in Division-22, Plumbing.

B. Pay for all required licenses, fees, inspections and permits.

1.3 RELATION TO OTHER WORK

A. Work Not in Division 22: Related work not included in this division consists of requirements given in the following as may be included in the contract documents:

1. Other divisions which may include work (such as concrete, steel, painting, ceiling systems, structure and other work) related to the work of Division 22.

B. Work of Division 22: Any or all sections of Division 22 may include a paragraph or paragraphs under the heading, "Relation to other Work". Where such a paragraph is indicated and work directly related to the section is listed or described, such work shall be considered as relating directly to the indicated section. Any related work (directly related or otherwise) which may be omitted by reference from the "Relation to Other Work" paragraph of such section(s), shall be provided as necessary and required whether or not such work is included by reference. Such listing or description of related work within a section is given only as a convenience to the Contractor; omission of other related sections or described work does not in any way exclude the provision of such work.

C. The Plumbing contractor shall coordinate with the controls vendor for all control related equipment that is provided by the controls vendor and installed by the Plumbing contractor.

1.4 CODES

A. Install all work in accordance with the latest edition of all applicable regulations and governing codes, including the regulations of the utility companies serving the project.

B. Where a conflict in code requirements occurs the more stringent requirement shall govern.

1.5 STANDARDS

A. All equipment and devices shall bear U.L. label, the label of an industry recognized approved testing agency or A.G.A. certification for said item of equipment or device.

B. All electrical devices must be U.L. approved.

1.6 DRAWINGS

A. Architectural and structural drawings take precedence over plumbing drawings with reference to the building construction. Plumbing drawings are diagrammatic and indicate the general arrangement and extent of work. Architectural drawings indicate more exactly the desired relationship between diffusers, registers, lighting fixtures, equipment, electric panels and devices, plumbing fixtures, and other items which remain exposed in the completed building. Exact locations and arrangement of materials and equipment shall be determined, with the acceptance of the Architect/Engineer, as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades. Where locations of equipment, devices or fixtures are controlled by architectural features, establish such locations by referring to dimensions on Architectural drawings and not by scaling drawings.

1.7 DISCREPANCIES

A. In case of differences between drawings and specifications, or where drawings and specifications are not clear or definitive, the more stringent requirement shall apply. Any such discrepancies shall be referred to Architect/Engineer for clarification and instructions.

1.8 ELECTRICAL PROVISIONS

A. Work of Division 22 shall include the electrical requirements which are indicated to be integral with plumbing work and which can be summarized to include (but not necessarily be limited to) the following:

1. Motors
2. Unless shown otherwise, motor starters are to be furnished by plumbing contractor, installed by electrical contractor.
3. In lieu of the plumbing contractor furnishing motor starters, the plumbing contractor can coordinate with the electrical contractor where the electrical contractor furnishes and installs a combination motor starter / disconnect switch.
4. Control switch, pilot lights, interlocks and similar devices.
5. Electrical heating coils and similar elements in plumbing equipment.
6. Electrical work specified in Division-22 for the HVAC control system.
7. Drip pans to protect electrical work.

B. Motors, Starters, Switches:

1. All motors 1HP and above associated with plumbing equipment that are not being provided with a variable frequency drive shall be provided with a motor starter.
2. For motors under 1HP that are required to be controlled shall be coordinated with the building automation system to ensure start / stop control is achieved. Provide all relays, wiring and devices as required to achieve desired control.

C. Drip Pans: Where possible, do not run plumbing piping directly above electrical (or electronic) equipment which is sensitive to moisture; otherwise provide drip pans under plumbing piping. Locate pan below piping and extend 6" on each side of piping and lengthwise 18" beyond equipment. Fabricate pans 2" deep, of reinforced sheet metal with rolled edges and soldered or welded seams; 20 gage copper, or 16 gage steel with 2 oz. zinc finish hot dipped after fabrication. Provide 3/4" copper drainage piping, properly discharged to a waste receptor.

1.9 ELECTRICAL/PLUMBING WORK

A. Definitions: Definitions for the purpose of Plumbing/electrical control and power coordination are as follows: (Note: The use of the words, "Provide", "furnish" and "install" are intended only for use in describing the coordination indicated by this paragraph and do not necessarily have the same definitions when used outside of the context of this paragraph.) Any items which do not fall within the scope of this paragraph shall be coordinated as individually specified.

1. "Furnish" means to procure an item and to deliver it to the project for installation.
2. "Install" means to determine (in coordination with others as necessary) the appropriate intended location of an item and to set and connect it in place.
3. "Provide" means to both furnish and install.
4. Power Circuit: Circuit which carries main electric power to apparatus to which the power circuit is connected.
5. Control Circuit: Circuit which carries electrical signals directing the performance of a controller, but which does not carry the main electric power. (See NEC, Section 430-71.) Such circuits shall also include those which serve a dual control and power function (e.g., a line voltage thermostat circuit which both activates and powers a small fan motor).
6. Controller: A device, or group of devices, which serves to govern, in some predetermined manner, electric power delivered to apparatus to which the controller is connected and includes any switch or device normally used to start and stop a motor. (See NEC, Article 100, Definitions, "Controller", and Section 430-81(a).)
7. Control Device: A device which reacts to an operating condition (pressure, temperature, flow, humidity, etc.) and which initiates transmission of an electrical control signal which causes operation of a controller or which causes operation of pressure switches, etc.
8. Auxiliary Control Device: A device (such as a low voltage control transformer, electric relay, etc.) which is located in a control circuit and which carries or responds to (but does not initiate) an electrical control signal initiated by a control device.

B. Work of Division-22 includes (but is not necessarily limited to):

1. Provide:

a. All controllers which are generally manufactured or shipped as integral with Division-22 equipment
b. All electric motors and other electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.) which are specified in Division 22.
c. All control circuits (including conduit and boxes) from the Division-26 panels to point of use including the necessary circuit breakers.
d. All other control circuits, including conduit and boxes.
e. All control connections to equipment.
f. All control connections to controllers, switches, motors and other plumbing systems electrical power consuming equipment (such as, electric boilers, electric hot water heaters, etc.).
g. Auxiliary control devices.
h. All control devices (thermostats, pressure switches, flow switches, humidistats, etc.) and make control circuit connections thereto.
i. Any and all pneumatic and electronic and electric control devices and electric or pneumatic connections thereto.

2. Furnish:

   a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-22 equipment.

1.10 AUXILIARIES AND ACCESSORIES

A. Include all auxiliaries and accessories for complete and properly operating systems.

1.11 COORDINATION

A. Provide all required coordination and supervision where work of this division connects to or is affected by work of others.

1.12 PROVISIONS FOR OPENINGS

A. Provide all openings required for work performed under Division-22. Provide sleeves or other approved methods to allow passage of items installed under any Section of Division-22.

1.13 CLEANING AND PROTECTION

A. Equipment: All plumbing equipment provided shall be thoroughly cleaned of all dirt, oil, concrete, etc. Any dents, scratches or other visible blemishes shall be corrected, and the appearance of the equipment made "like new" and to the satisfaction of the Architect/Engineer.

B. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.

C. Protection of Work Until Final Acceptance: Protect all materials and equipment from damage, entrance of dirt and construction debris from the time of installation until final acceptance. Any materials and equipment which are damaged shall be repaired to "as new" condition or replaced at the direction of the Architect/Engineer. Where factory finishes occur and damage is minor, finishes may be touched up. If, in the opinion of the Architect/Engineer the damage is excessive, factory finish shall be replaced to "new" condition.

1.14 SHOP DRAWINGS

A. Submit shop drawings for all items, services and systems included in the project.

B. Shop drawings shall clearly show the following:

1. Technical and descriptive data in detail equal to or greater than the data given in the item specification. Indicate all characteristics, special modifications and features. Where performance and characteristic data is shown on the drawings or specified, submitted data shall be provided in a degree which is both quantitatively and qualitatively equal to that specified and shown so that comparison can be made. Present data in detail equal to or greater than that given in item specification and include all weights, deflections, speeds, velocities, pressure drops, operating temperatures, operating curves, temperature ranges, sound ratings, dimensions, sizes, manufacturers' names, model numbers, types of material used, operating pressures, full load amperages, starting amperages, fouling factors, capacities, set points, chemical compositions, certifications and endorsements, operating voltages, thicknesses, gauges and all other related information as applicable to particular item.

2. Exceptions to or deviations from the contract documents. Should Architect/Engineer accept any items having such deviations which are not clearly brought to Architect/Engineer's attention, in writing, on item submittal, then Contractor is responsible for correction of such deviations regardless of when such deviations are discovered.

C. Additional Requirements: See specific sections of the Specifications for any additional requirements.

1.15 SHOP DRAWINGS TECHNICAL INFORMATION SUBMITTALS

A. All submittals are to be submitted electronically in the form of PDF. Electronic submittal file names must be formatted with the specification section number followed by the title of the specification section. One PDF file shall be provided for each specification section that requires submittals to be provided.

B. A cover page shall have adequate space for Contractor, Subcontractor and Engineer review stamps and indicate the following minimum data:

1. Project Name
2. Project Address
3. Contractor Name
4. Subcontractor Name
5. Specification Section Number
6. Specification Section Name
7. Submittal Date

C. All shop drawings and equipment submittals shall be submitted complete based on specification division. Partial submittals of each specification section will not be accepted.

D. All submittals shall have been reviewed for compliance by the Contractor and associated subcontractor prior to submission to the Engineer. A stamp bearing the name of the reviewer and date review was completed shall be on the cover page of the submittal.

E. Submittal data shall be logically grouped based on equipment tags or like material. For submittals that contain data on multiple materials or equipment, it shall be clearly noted by equipment tag or applicable material.

F. Manufacturer’s data indicating multiple options or choices shall be clearly noted as to what is applicable to the material and equipment being provided. Information not applicable should be struck through or extracted.

1.16 SHOP DRAWINGS FOR PIPING SYSTEMS

A. Shop drawings for piping systems shall be performed by the installing subcontractors. Shop drawings shall show all required maintenance and operational clearances required. Title drawings shall include identification of project and names of Architect, Engineer, Contractor, subcontractor and/or supplier, date, be numbered sequentially and shall indicate the following:

1. Architectural and structural backgrounds with room names and numbers, etc., including but not limited to plans, sections, elevations, details, etc.

a. Fabrication and Erection dimensions.
b. Arrangements and sectional views.

c. Necessary details, including complete information for making connections with other work.
d. Kinds of materials and finishes.
e. Descriptive names of equipment.
f. Modifications and options to standard equipment required by the contract.

B. Shop drawings shall be submitted in electronic PDF format and shall bear the review stamp from the plumbing subcontractor and general contractor / CM that it has been reviewed for compliance.

C. See specific sections of specifications for further requirements.

1.17 ELECTRONIC FILES

A. Any requests for electronic files shall be preceded by processing the required electronic file release form and submitting to the Engineer for authorization. Request for electronic files should be submitted through the Contractor for submission to the Architect / Engineer.

1.18 OPERATING INSTRUCTIONS

A. Submit for checking a specific set of written operating instructions on each item which requires instructions to operate. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe operating instructions.

1.19 MAINTENANCE INFORMATION

A. Submit for acceptance Maintenance Information consisting of manufacturer's printed instruction and parts lists for each major item of equipment. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe maintenance.

1.20 SYSTEM GUARANTEE

A. The work required under Division-22 shall include a one-year guarantee. This guarantee shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System. This guarantee shall also include reasonable adjustments of the system required for proper operation during the guarantee period.

1.21 MATERIALS AND EQUIPMENT

A. Each bidder represents that his bid is based upon the materials and equipment described in this division of the specifications.

1. Submittal shall include the name of the material or equipment for which it is to be substituted, substituted equipment model numbers, drawings, cuts, performance and test data and any other data or information necessary for the Architect/Engineer to determine that the equipment meets all specification and requirements. If the Architect/Engineer accepts any proposed substitutions, such acceptance will be set forth in writing.
2. Substituted equipment with all accessories installed or optional equipment where permitted and accepted, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether accepted or not, shall be replaced at the Contractor's expense. Any modifications of related systems of this or

other trades as a result of substitutions shall be made at the Contractor's expense, and Contractor shall so state in his written request for substitution.

B. Acceptable Manufacturers: Materials and Equipment specified in these contract documents are accepted only in regard to general performance and quality. It shall be the Contractor's responsibility to ensure that acceptable materials and equipment meet or exceed the efficiencies, capacities, electrical characteristics, performance and quality of the equipment herein specified. Acceptable equipment must also generally conform, without extensive modification of related systems to the accessories, weights, space and maintenance requirements, etc., of the specified equipment. Any modification to related systems of this or other trades shall be made at the Contractor's expense and the Contractor shall be responsible for coordination between trades. Any difference in capacity, efficiency, electrical characteristics, weights or quality of product, etc., between specified materials and equipment and acceptable alternates shall be submitted to the Architect/Engineer for acceptance within 30 days of Notice to Proceed.

PART 2 - PRODUCTS

2.1 Section part not applicable.

PART 3 - EXECUTION

3.1 Section part not applicable.

END OF SECTION 22 01 00

SECTION 22 05 19
METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Bimetallic-actuated thermometers.
2. Filled-system thermometers.
3. Liquid-in-glass thermometers.
4. Thermowells.
5. Dial-type pressure gages.
6. Gage attachments.
7. Test plugs.
8. Test-plug kits.
9. Sight flow indicators.

B. Related Requirements:

1. Section 22 11 13 "Facility Water Distribution Piping" for domestic water meters and combined domestic and fire-protection water-service meters outside the building.
2. Section 22 11 19 "Domestic Water Piping Specialties" for water meters.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 BIMETALLIC-ACTUATED THERMOMETERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ashcroft Inc.
2. Ernst Flow Industries.
3. Miljoco Corporation.
4. Palmer Wahl Instrumentation Group.
5. REOTEMP Instrument Corporation.
6. WATTS.
7. Weiss Instruments, Inc.
8. Weksler Glass Thermometer Corp.

9. WIKA Instrument Corporation.

B. Standard: ASME B40.200.

2.2 FILLED-SYSTEM THERMOMETERS

A. Direct-Mounted, Metal-Case, Vapor-Actuated Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Ashcroft Inc.
b. Marsh Bellofram.
c. Miljoco Corporation.
d. Palmer Wahl Instrumentation Group.
e. REOTEMP Instrument Corporation.
f. Weiss Instruments, Inc.

2. Standard: ASME B40.200.

B. Remote-Mounted, Metal-Case, Vapor-Actuated Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AMETEK, Inc.
b. Ashcroft Inc.
c. Miljoco Corporation.
d. Palmer Wahl Instrumentation Group.
e. REOTEMP Instrument Corporation.
f. Weiss Instruments, Inc.
g. WIKA Instrument Corporation.

2. Standard: ASME B40.200.

2.3 LIQUID-IN-GLASS THERMOMETERS

A. Metal-Case, Compact-Style, Liquid-in-Glass Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Trerice, H. O. Co.

2. Standard: ASME B40.200.

2.4 THERMOWELLS

A. Thermowells:

1. Standard: ASME B40.200.
2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
3. Insertion Length: Length required to match thermometer bulb or stem.
4. Lagging Extension: Include on thermowells for insulated piping and tubing.

5. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

2.5 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Ametek U.S. Gauge.
   b. Ashcroft Inc.
   c. Ernst Flow Industries.
   d. Flo Fab Inc.
   e. Marsh Bellofram.
   f. Miljoco Corporation.
   g. Noshok.
   h. Palmer Wahl Instrumentation Group.
   i. REOTEMP Instrument Corporation.
   j. Tel-Tru Manufacturing Company.
   k. Trerice, H. O. Co.
   l. WATTS.
   m. Weiss Instruments, Inc.
   n. Weksler Glass Thermometer Corp.
   o. WIKA Instrument Corporation.
   p. Winters Instruments - U.S.

2. Standard: ASME B40.100.

B. Remote-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Ametek U.S. Gauge.
   b. Ashcroft Inc.
   c. Ernst Flow Industries.
   d. Flo Fab Inc.
   e. Marsh Bellofram.
   f. Miljoco Corporation.
   g. Noshok.
   h. Palmer Wahl Instrumentation Group.
   i. REOTEMP Instrument Corporation.
   j. Tel-Tru Manufacturing Company.
   k. Trerice, H. O. Co.
   l. WATTS.
   m. Weiss Instruments, Inc.
   n. WIKA Instrument Corporation.
   o. Winters Instruments - U.S.

2. Standard: ASME B40.100.

2.6 GAGE ATTACHMENTS

A. Snubbers: ASME B40.100, brass; with ASME B1.20.1 pipe threads and surge-dampening device. Include extension for use on insulated piping.

B. Valves: ASME B1.20.1 pipe threads.

2.7 TEST PLUGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flow Design, Inc.
2. Miljoco Corporation.
3. Nexus Valve, Inc.
4. Peterson Equipment Co., Inc.
5. Sisco Manufacturing Company, Inc.
6. Trerice, H. O. Co.
7. WATTS.
8. Weiss Instruments, Inc.
9. Weksler Glass Thermometer Corp.

B. Description: Test-station fitting made for insertion into piping tee fitting.

C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.

D. Thread Size: ASME B1.20.1 pipe thread.

2.8 TEST-PLUG KITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flow Design, Inc.
2. Miljoco Corporation.
3. Nexus Valve, Inc.
4. Peterson Equipment Co., Inc.
5. Sisco Manufacturing Company, Inc.
6. Trerice, H. O. Co.
7. WATTS.
8. Weiss Instruments, Inc.

B. Furnish test-plug kit(s) containing thermometer(s), one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.

C. Low-Range Thermometer: Small, bimetallic insertion type with diameter dial and tapered-end sensing element.

D. High-Range Thermometer: Small, bimetallic insertion type with dial and tapered-end sensing element.

E. Pressure Gage: Small, Bourdon-tube insertion type with dial and probe.

F. Carrying Case: Metal or plastic, with formed instrument padding.

2.9 SIGHT FLOW INDICATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ARCHON Industries, Inc.
2. Dwyer Instruments, Inc.
3. Emerson Process Management; Rosemount Division.
4. Ernst Flow Industries.
5. John C. Ernst Co., Inc.
6. KOBOLD Instruments, Inc. - USA.
7. OPW Engineered Systems; OPW Fluid Transfer Group; a Dover company.
8. Pentair Valves & Controls; Penberthy Brand.

B. Description: Piping inline-installation device for visual verification of flow.

C. Construction: Bronze or stainless-steel body, with sight glass and indicator, and threaded or flanged ends.

D. End Connections for NPS 2 and Smaller: Threaded.

E. End Connections for NPS 2-1/2 and Larger: Flanged.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install thermowells with socket extending in vertical position in piping tees.

B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.

C. Install thermowells with extension on insulated piping.

D. Fill thermowells with heat-transfer medium.

E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.

F. Install remote-mounted thermometer bulbs in thermowells and install cases on panels; connect cases with tubing and support tubing to prevent kinks. Use minimum tubing length.

G. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.

H. Install remote-mounted pressure gages on panel.

I. Install valve and snubber in piping for each pressure gage for fluids.

J. Install test plugs in piping tees.

K. Install thermometers in the following locations:

1. Inlet and outlet of each water heater.
2. Inlet and outlet of each domestic hot-water storage tank.
3. Inlet and outlet of each remote domestic water chiller.

L. Install pressure gages in the following locations:

1. Building water service entrance into building.
2. Inlet and outlet of each pressure-reducing valve.
3. Suction and discharge of each domestic water pump.

3.2 CONNECTIONS

A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 ADJUSTING

A. Adjust faces of meters and gages to proper angle for best visibility.

END OF SECTION 22 05 19

SECTION 22 05 23.12
BALL VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.

1.3 DEFINITIONS

A. CWP: Cold working pressure.

1.4 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.5 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

1. Certification that products comply with NSF 61and NSF 372.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, and soldered ends.
3. Set ball valves open to minimize exposure of functional surfaces.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B1.20.1 for threads for threaded end valves.
2. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
3. ASME B16.18 for solder-joint connections.
4. ASME B31.9 for building services piping valves.

C. NSF Compliance: NSF 61 and NSF 372 for valve materials for potable-water service.

D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.

E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

F. Valve Sizes: Same as upstream piping unless otherwise indicated.

G. Valve Actuator Types:

1. Gear Actuator: For quarter-turn valves NPS 4 and larger.
2. Handlever: For quarter-turn valves smaller than NPS 4.

H. Valves in Insulated Piping:

1. Include 2-inch stem extensions.
2. Extended operating handles of nonthermal-conductive material and protective sleeves that allow operation of valves without breaking vapor seals or disturbing insulation.
3. Memory stops that are fully adjustable after insulation is applied.

2.2 BRASS BALL VALVES

A. Brass Ball Valves, Two-Piece with Full Port and Brass Trim, Threaded or Soldered Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Elkhart Products Corporation.
d. Jomar Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. WATTS.

2. Description:

a. Standard: MSS SP-110 or MSS SP-145.

b. CWP Rating: 600 psig.
c. Body Design: Two piece.
d. Body Material: Forged brass.
e. Ends: Threaded and soldered.
f. Seats: PTFE.
g. Stem: Brass.
h. Ball: Chrome-plated brass.
i. Port: Full.

B. Brass Ball Valves, Two-Piece with Full Port and Brass Trim, Press Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Elkhart Products Corporation.
d. Hammond Valve.
e. Jomar Valve.
f. Legend Valve & Fitting, Inc.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Stockham; Crane Energy Flow Solutions.
j. WATTS.

2. Description:

a. Standard: MSS SP-110 or MSS SP-145.
b. CWP Rating: Minimum 200 psig.
c. Body Design: Two piece.
d. Body Material: Forged brass.
e. Ends: Press.
f. Press Ends Connections Rating: Minimum 200 psig.
g. Seats: PTFE or RPTFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.
k. O-Ring Seal: Buna-N or EPDM.

C. Brass Ball Valves, Two-Piece with Regular Port and Brass Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Hammond Valve.
c. Milwaukee Valve Company.
d. NIBCO INC.
e. WATTS.

2. Description:

a. Standard: MSS SP-110.
b. CWP Rating: 600 psig.
c. Body Design: Two piece.

d. Body Material: Forged brass.
e. Ends: Threaded and soldered.
f. Seats: PTFE.
g. Stem: Brass.
h. Ball: Chrome-plated brass.
i. Port: Regular.

2.3 BRONZE BALL VALVES

A. Bronze Ball Valves, Two-Piece with Full Port, and Bronze or Brass Trim, Threaded or Soldered Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. FNW; Ferguson Enterprises, Inc.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. WATTS.
g. Zurn Industries, LLC.

2. Description:

a. Standard: MSS SP-110 or MSS-145.
b. CWP Rating: 600 psig.
c. Body Design: Two piece.
d. Body Material: Bronze.
e. Ends: Threaded and soldered.
f. Seats: PTFE.
g. Stem: Bronze or brass.
h. Ball: Chrome-plated brass.
i. Port: Full.

B. Bronze Ball Valves, Two-Piece with Full Port, and Bronze or Brass Trim, Press Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Milwaukee Valve Company.
d. NIBCO INC.
e. WATTS.
f. Zurn Industries, LLC.

2. Description:

a. Standard: MSS SP-110 or MSS-145.
b. CWP Rating: Minimum 200 psig.
c. Body Design: Two piece.
d. Body Material: Bronze.
e. Ends: Press.
f. Press Ends Connections Rating: Minimum 200 psig.

g. Seats: PTFE or RTPFE.
h. Stem: Bronze or brass.
i. Ball: Chrome-plated brass.
j. Port: Full.
k. O-Ring Seal: EPDM or Buna-N.

C. Bronze Ball Valves, Two-Piece with Regular Port and Bronze or Brass Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Milwaukee Valve Company.
c. NIBCO INC.
d. WATTS.

2. Description:

a. Standard: MSS SP-110.
b. CWP Rating: 600 psig.
c. Body Design: Two piece.
d. Body Material: Bronze.
e. Ends: Threaded.
f. Seats: PTFE.
g. Stem: Bronze or brass.
h. Ball: Chrome-plated brass.
i. Port: Regular.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

F. Install valves and cocks in horizontal piping with the valve stem in the vertical upright position.

G. Install valves and cocks to provide adequate clearance to permit easy operation of the valve hand wheel and permit servicing of the valve packing.

3.2 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

E. Install valve tags. Comply with requirements in Section 22 05 53 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 ACCESS PANELS

A. Furnish adequate number of properly sized access panels to adequately service and maintain systems installed under each section of specifications.

B. Access panels shall be installed and painted under other divisions of these specifications. Exact panel location shall be designated by the subcontractor performing the work of this Section.

C. Access panels are not required in exposed grid or other types of readily removable ceilings.

D. Access panels shall not compromise the fire rating of the wall.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.

B. Select valves with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option or press-end option is indicated in valve schedules below.
2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.5 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Brass ball valve, one piece. Provide with threaded or solder-joint ends.
2. Bronze ball valve, one piece with bronze trim. Provide with threaded or solder-joint ends.
3. Brass ball valves, two-piece with full port and brass trim. Provide with threaded or solder joint ends.
4. Bronze ball valves, two-piece with full port and bronze or brass trim. Provide with threaded or solder-joint ends.

5. Brass ball valves, three-piece with full port and brass trim.
6. Bronze ball valves, three-piece with full port and bronze or brass trim.
7. Bronze ball valves, two-piece with regular port and bronze trim.

B. Pipe NPS 2-1/2 and Larger:

1. Steel and Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
2. Steel ball valves, Class 150 with full port.
3. Iron ball valves, Class 150.

END OF SECTION 22 05 23.12

SECTION 22 05 23.14
CHECK VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Bronze lift check valves.
2. Bronze swing check valves.
3. Bronze swing check valves, press ends.
4. Iron swing check valves.
5. Iron swing check valves with closure control.
6. Iron, grooved-end swing check valves.
7. Iron, center-guided check valves.
8. Iron, plate-type check valves.

1.3 DEFINITIONS

A. CWP: Cold working pressure.

B. EPDM: Ethylene propylene-diene terpolymer rubber.

C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

1.4 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.5 ACTION SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

B. Product Data: For each type of valve:

1. Certification that products comply with NSF 61 and NSF 372.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B1.20.1 for threads for threaded end valves.
2. ASME B16.1 for flanges on iron valves.
3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
4. ASME B16.18 for solder joint.
5. ASME B31.9 for building services piping valves.

C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.

D. Drinking Water System Components - Health Effects and Drinking Water System Components - Lead Content Compliance: NSF 61 and NSF 372.

E. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.

F. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

G. Valve Sizes: Same as upstream piping unless otherwise indicated.

H. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE LIFT CHECK VALVES

A. Bronze Lift Check Valves with Bronze Disc, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane; Crane Energy Flow Solutions.
b. Jenkins Valves; Crane Energy Flow Solutions.
c. Stockham; Crane Energy Flow Solutions.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.

c. Body Design: Vertical flow.
d. Body Material: ASTM B 61 or ASTM B 62, bronze.
e. Ends: Threaded or soldered. See valve schedule articles.
f. Disc: Bronze.

2.3 BRONZE SWING CHECK VALVES

A. Bronze Swing Check Valves with Bronze Disc, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. NIBCO INC.
e. Stockham; Crane Energy Flow Solutions.
f. WATTS.

2. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded or soldered. See valve schedule articles.
f. Disc: Bronze.

B. Bronze Swing Check Valves with Bronze Disc, Class 150:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. Jomar Valve.
e. NIBCO INC.
f. Stockham; Crane Energy Flow Solutions.

2. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 300 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded or soldered. See valve schedule articles.
f. Disc: Bronze.

C. Bronze Swing Check Valves, Press Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Elkhart Products Corporation.
c. Milwaukee Valve Company.
d. NIBCO INC.

2. Description:

a. Standard: MSS SP-80 and MSS SP-139.
b. CWP Rating: Minimum 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 584, bronze.
e. Ends: Press.
f. Press Ends Connection Rating: Minimum 200 psig
g. Disc: Brass or bronze.

2.4 IRON SWING CHECK VALVES

A. Iron Swing Check Valves with Metal Seats, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. NIBCO INC.
e. Powell Valves.
f. Red-White Valve Corp.
g. Stockham; Crane Energy Flow Solutions.
h. Sure Flow Equipment Inc.
i. WATTS.

2. Description:

a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged or threaded. See valve schedule articles.
f. Trim: Bronze.
g. Gasket: Asbestos free.

B. Iron Swing Check Valves with Metal Seats, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. NIBCO INC.
e. Stockham; Crane Energy Flow Solutions.
f. WATTS.

2. Description:

a. Standard: MSS SP-71, Type I.
b. CWP Rating: 500 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged or threaded. See valve schedule articles.
f. Trim: Bronze.
g. Gasket: Asbestos free.

2.5 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Iron Swing Check Valves with Lever- and Spring-Closure Control, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane; Crane Energy Flow Solutions.
b. Jenkins Valves; Crane Energy Flow Solutions.
c. NIBCO INC.
d. Stockham; Crane Energy Flow Solutions.
e. WATTS.

2. Description:

a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged or threaded. See valve schedule articles.
f. Trim: Bronze.
g. Gasket: Asbestos free.
h. Closure Control: Factory-installed exterior lever and weight.

B. Iron Swing Check Valves with Lever and Weight-Closure Control, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. NIBCO INC.
e. Stockham; Crane Energy Flow Solutions.
f. WATTS.

2. Description:

a. Standard: MSS SP-71, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Clear or full waterway.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged or threaded. See valve schedule articles.
f. Trim: Bronze.

g. Gasket: Asbestos free.
h. Closure Control: Factory-installed exterior lever and weight.

2.6 IRON, GROOVED-END SWING CHECK VALVES

A. Iron, Grooved-End Swing Check Valves, 300 CWP:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International.
b. Shurjoint Piping Products USA Inc.
c. Tyco Fire Products LP.
d. Victaulic Company.

2. Description:

a. CWP Rating: 300 psig.
b. Body Material: ASTM A 536, ductile iron.
c. Seal: EPDM.
d. Disc: Spring operated, ductile iron or stainless steel.

2.7 IRON, CENTER-GUIDED, SPRING-LOADED CHECK VALVES

A. Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International.
b. APCO Willamette Valve and Primer Corporation.
c. Crispin Valve.
d. DFT Inc.
e. Flo Fab Inc.
f. FNW; Ferguson Enterprises, Inc.
g. Milwaukee Valve Company.
h. Mueller Steam Specialty; A WATTS Brand.
i. NIBCO INC.
j. Val-Matic Valve & Manufacturing Corp.
k. WATTS.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron.
d. Style: Compact wafer, spring loaded.
e. Seat: Bronze.

B. Iron Globe, Center-Guided Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Flomatic Corporation.
e. Milwaukee Valve Company.
f. Mueller Steam Specialty; A WATTS Brand.
g. NIBCO INC.
h. Sure Flow Equipment Inc.
i. Val-Matic Valve & Manufacturing Corp.
j. WATTS.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron.
d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: Bronze.

C. Iron Globe, Center-Guided Check Valves with Metal Seat, Class 150:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. Val-Matic Valve & Manufacturing Corp.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 300 psig.
c. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: Bronze.

D. Iron Globe, Center-Guided Check Valves with Metal Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Flomatic Corporation.
c. Metraflex Company (The).
d. Mueller Steam Specialty; A WATTS Brand.
e. NIBCO INC.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 400 psig.
c. Body Material: ASTM A 126, gray iron.

d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: Bronze.

E. Iron Globe, Center-Guided Check Valves with Metal Seat, Class 300:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. Val-Matic Valve & Manufacturing Corp.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 500 psig.
c. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: Bronze.

F. Iron Globe, Center-Guided Check Valves with Resilient Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Apollo Flow Controls; Conbraco Industries, Inc.
c. NIBCO INC.
d. Sure Flow Equipment Inc.
e. Val-Matic Valve & Manufacturing Corp.
f. Zurn Industries, LLC.

2. Description:

a. Standard: MSS SP-125.
b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron.
d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: NBR.

G. Iron Globe, Center-Guided Check Valves with Resilient Seat, Class 300:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Val-Matic Valve & Manufacturing Corp.

2. Description:

a. Standard: MSS SP-125.

b. CWP Rating: 500 psig.
c. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
d. Style: Globe, spring loaded.
e. Ends: Flanged.
f. Seat: NBR.

2.8 IRON, PLATE-TYPE CHECK VALVES

A. Iron, Dual-Plate Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crane; Crane Energy Flow Solutions.
   c. Powell
   d. Mueller Steam Specialty; A WATTS Brand.

2. Standard: API 594.
3. CWP Rating: 200 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 126, gray iron.
6. Seat: Bronze.

B. Iron, Dual-Plate Check Valves with Metal Seat, Class 150:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crane; Crane Energy Flow Solutions.
   c. Mueller Steam Specialty; A WATTS Brand.
   d. Val-Matic Valve & Manufacturing Corp.

2. Standard: API 594.
3. CWP Rating: 300 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
6. Seat: Bronze.

C. Iron, Dual-Plate Check Valves with Metal Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crane; Crane Energy Flow Solutions.

2. Standard: API 594.
3. CWP Rating: 400 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 126, gray iron.
6. Seat: Bronze.

D. Iron, Dual-Plate Check Valves with Metal Seat, Class 300:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. APCO Willamette Valve and Primer Corporation.
    b. Crane; Crane Energy Flow Solutions.
    c. Mueller Steam Specialty; A WATTS Brand.
    d. Val-Matic Valve & Manufacturing Corp.

2. Standard: API 594.
3. CWP Rating: 500 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
6. Seat: Bronze.

E. Iron, Single-Plate Check Valves with Resilient Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Flo Fab Inc.
    b. Keckley Company.
    c. Sure Flow Equipment Inc.

2. Standard: API 594.
3. CWP Rating: 200 psig.
4. Body Design: Wafer, spring-loaded plate.
5. Body Material: ASTM A 126, gray iron.

F. Iron, Dual-Plate Check Valves with Resilient Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. APCO Willamette Valve and Primer Corporation.
    b. Cooper Cameron Valves.
    c. Crane; Crane Energy Flow Solutions.
    d. NIBCO INC.
    e. Spence Strainers International.
    f. Sure Flow Equipment Inc.
    g. WATTS.

2. Standard: API 594.
3. CWP Rating: 200 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 126, gray iron.
6. Seat: NBR.

G. Iron, Dual-Plate Check Valves with Resilient Seat, Class 150:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crane; Crane Energy Flow Solutions.
c. Val-Matic Valve & Manufacturing Corp.

2. Standard: API 594.
3. CWP Rating: 300 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
6. Seat: NBR.

H. Iron, Wafer, Single-Plate Check Valves with Resilient Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Sure Flow Equipment Inc.

2. Standard: API 594.
3. CWP Rating: 400 psig.
4. Body Design: Wafer, spring-loaded plate.
5. Body Material: ASTM A 126, gray iron.
6. Seat: NBR.

I. Iron, Dual-Plate Check Valves with Resilient Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crane; Crane Energy Flow Solutions.
c. Sure Flow Equipment Inc.

2. Standard: API 594.
3. CWP Rating: 400 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 126, gray iron.
6. Seat: NBR.

J. Iron, Dual-Plate Check Valves with Resilient Seat, Class 300:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Val-Matic Valve & Manufacturing Corp.

2. Standard: API 594.
3. CWP Rating: 500 psig.
4. Body Design: Wafer, spring-loaded plates.
5. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
6. Seat: NBR.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

E. Check Valves: Install check valves for proper direction of flow.

1. Swing Check Valves: In horizontal position with hinge pin level.
2. Check Valves: In horizontal or vertical position, between flanges.
3. Lift Check Valves: With stem upright and plumb.

F. Install valve tags. Comply with requirements in Section 22 05 53 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 ACCESS PANELS

A. Furnish adequate number of properly sized access panels to adequately service and maintain systems installed under each section of specifications.

B. Access panels shall be installed and painted under other divisions of these specifications. Exact panel location shall be designated by the subcontractor performing the work of this Section.

C. Access panels are not required in exposed grid or other types of readily removable ceilings.

D. Access panels shall not compromise the fire rating of the wall.

3.5 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Pump-Discharge Check Valves:

a. NPS 2 and Smaller: Bronze swing check valves with bronze disc.
b. NPS 2-1/2 and Larger for Domestic Water: Iron swing check valves with lever and weight or spring; or iron, center-guided check valves.
c. NPS 2-1/2 and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.

B. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.

C. End Connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded or soldered or press-ends.
2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged or threaded.
3. For Copper Tubing, NPS 5 and Larger: Flanged.
4. For Steel Piping, NPS 2 and Smaller: Threaded.
5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged or threaded.
6. For Steel Piping, NPS 5 and Larger: Flanged.
7. For Grooved-End Copper Tubing: Grooved.

3.6 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze swing check valves with bronze disc, with soldered end connections.
2. Bronze swing check valves with press-end connections.

B. Pipe NPS 2-1/2 and Larger:

1. Iron swing check valves with metal seats, with threaded or flanged end connections.
2. Iron swing check valves with closure control lever, Class 125, with threaded or flanged end connections.
3. Iron, grooved-end swing check valves, 300 CWP.
4. Iron, center-guided check valves with compact wafer, Class 125.
5. Iron, center-guided check valves with metal or resilient seat, with threaded or flanged end connections.
6. Iron, dual-plate check valves with metal seat, with threaded or flanged end connections.
7. Iron, single-plate check valves with resilient seat, with threaded or flanged end connections.

END OF SECTION 22 05 23.14

SECTION 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Fastener systems.
5. Pipe stands.
6. Equipment supports.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Submit manufacturer's data for review before any work is commenced

B. fabrication and installation details and include calculations for the following:

1. Trapeze pipe hangers.
2. Metal framing systems.
3. Fiberglass strut systems.
4. Pipe stands.
5. Equipment supports.

C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of trapeze hangers.
2. Include design calculations for designing trapeze hangers.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Structural-Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.

B. Pipe Welding Qualifications: Qualify procedures and operators according to 2015 ASME Boiler and Pressure Vessel Code, Section IX.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design trapeze pipe hangers and equipment supports.

B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

2.2 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized, hot-dip galvanized, or electro-galvanized.
3. Nonmetallic Coatings: Plastic coated or epoxy powder coated.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe and Tube Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly, made from structural-carbon-steel shapes, with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. B-line, an Eaton business.
    b. Flex-Strut Inc.
    c. G-Strut.
    d. Haydon Corporation.
    e. Thomas & Betts Corporation; A Member of the ABB Group.
    f. Unistrut; Part of Atkore International.
    g. Wesanco, Inc.

2. Description: Shop- or field-fabricated pipe-support assembly, made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4, factory-fabricated components for field assembly.
4. Channels: Continuous slotted channel with inturned lips.
5. Channel Width: Selected for applicable load criteria.
6. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
7. Hanger Rods: Continuous-thread rod, nuts, and washer

B. Non-MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Anvil International.
    b. Carpenter & Paterson, Inc.
    c. Empire Industries, Inc.
    d. FNW; Ferguson Enterprises, Inc.
    e. MIRO Industries.
    f. PHD Manufacturing, Inc.

2. Description: Shop- or field-fabricated pipe-support assembly, made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4, factory-fabricated components for field assembly.
4. Channels: Continuous slotted channel with inturned lips.
5. Channel Width: Select for applicable load criteria.
6. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
7. Hanger Rods: Continuous-thread rod, nuts, and washer

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hilti, Inc.
b. ITW Ramset/Red Head; Illinois Tool Works, Inc.
c. MKT Fastening, LLC.
d. Simpson Strong-Tie Co., Inc.

B. Mechanical-Expansion Anchors: Insert-wedge-type anchors, for use in hardened portland cement concrete, with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. B-line, an Eaton business.
b. Empire Tool and Manufacturing Co., Inc.
c. Hilti, Inc.
d. ITW Ramset/Red Head; Illinois Tool Works, Inc.
e. MKT Fastening, LLC.

2. Indoor Applications: Zinc-coated or stainless steel.
3. Outdoor Applications: Stainless steel.

2.6 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

B. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-carbon-steel shapes.

2.8 MATERIALS

A. Aluminum: ASTM B 221.

B. Carbon Steel: ASTM A 1011/A 1011M.

C. Structural Steel: ASTM A 36/A 36M carbon-steel plates, shapes, and bars; black and galvanized.

D. Stainless Steel: ASTM A 240/A 240M.

E. Grout: ASTM C 1107/C 1107M, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with requirements in Section 07 84 13 "Penetration Firestopping" for firestopping materials and installation, for penetrations through fire-rated walls, ceilings, and assemblies.

B. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

3.2 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-58. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size, or install intermediate supports for smaller-diameter pipes as specified for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Fiberglass Pipe-Hanger Installation: Comply with applicable portions of MSS SP-58. Install hangers and attachments as required to properly support piping from building structure.

D. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

E. Thermal Hanger-Shield Installation: Install in pipe hanger or shield for insulated piping.

F. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete, after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
2. Install mechanical-expansion anchors in concrete, after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

G. Pipe Stand Installation:

1. Pipe Stand Types, except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 07 72 00 "Roof Accessories" for curbs.

H. Pipe-Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

I. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

J. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

K. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

L. Install lateral bracing with pipe hangers and supports to prevent swaying.

M. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms, and install reinforcing bars through openings at top of inserts.

N. Load Distribution: Install hangers and supports, so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

O. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

P. Insulated Piping:

1. Attach clamps and spacers to piping.

    a. Piping Operating Above Ambient Air Temperature: Clamp may project through insulation.
    b. Piping Operating Below Ambient Air Temperature: Use thermal hanger-shield insert with clamp sized to match OD of insert.
    c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39 protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

    a. Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

    a. Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

4. Shield Dimensions for Pipe: Not less than the following:

    a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
    b. NPS 4: 12 inches long and 0.06 inch thick.
    c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
    d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
    e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.

5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
6. Thermal Hanger Shields: Install with insulation of same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment, and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and/or equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections, so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.6 PAINTING

A. Touchup: Clean field welds and abraded, shop-painted areas. Paint exposed areas immediately after erecting hangers and supports. Use same materials as those used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas, and apply galvanizing-repair paint to comply with ASTM A 780/A 780M.

3.7 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-58 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finishes.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel attachments for general service applications.

F. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Use thermal hanger-shield inserts for insulated piping and tubing.

I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.

14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction occurs.
18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction occurs.
19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction occurs but vertical adjustment is unnecessary.
20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction occurs and vertical adjustment is unnecessary.
21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation, in addition to expansion and contraction, is required.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment of up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11 split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable-Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.

7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal Hanger-Shield Inserts: For supporting insulated pipe.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load, and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load, and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load, and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

    a. Horizontal (MSS Type 54): Mounted horizontally.
    b. Vertical (MSS Type 55): Mounted vertically.

c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.

O. Comply with MSS SP-58 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

Q. Use pipe-positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 22 05 29

SECTION 22 05 53
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Brady Corporation.
    b. Brimar Industries, Inc.
    c. Carlton Industries, LP.
    d. Champion America.
    e. Craftmark Pipe Markers.
    f. emedco.
    g. Kolbi Pipe Marker Co.
    h. LEM Products Inc.
    i. Marking Services, Inc.
    j. Seton Identification Products.

2. Material and Thickness: Stainless steel, 0.025-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
3. Letter Color: Black.
4. Background Color: Yellow.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
7. Fasteners: Stainless-steel rivets.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Brady Corporation.
   b. Brimar Industries, Inc.
   c. Carlton Industries, LP.
   d. Champion America.
   e. Craftmark Pipe Markers.
   f. emedco.
   g. Kolbi Pipe Marker Co.
   h. LEM Products Inc.
   i. Marking Services, Inc.
   j. Seton Identification Products.

2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
3. Letter Color: Black.
4. Background Color: Yellow.
5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
8. Fasteners: Stainless-steel rivets.
9. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Brady Corporation.
2. Brimar Industries, Inc.
3. Carlton Industries, LP.
4. Champion America.
5. Craftmark Pipe Markers.
6. emedco.
7. LEM Products Inc.
8. Marking Sevices Inc.
9. National Marker Company.
10. Seton Identification Products.

11. Stranco, Inc.

B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

C. Letter Color: Black.

D. Background Color: Yellow.

E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.

H. Fasteners: Stainless-steel rivets.

I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
2. Brady Corporation.
3. Brimar Industries, Inc.
4. Carlton Industries, LP.
5. Champion America.
6. Craftmark Pipe Markers.
7. emedco.
8. Kolbi Pipe Marker Co.
9. LEM Products Inc.
10. Marking Sevices Inc.
11. Seton Identification Products.

B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.

D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: Size letters according to ASME A13.1 for piping.

PART 3 - EXECUTION

3.1 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.2 PIPE LABEL INSTALLATION

A. Piping Color Coding: Painting of piping is specified in Architectural drawings and/or specifications.

B. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

C. Pipe Label Color Schedule:

1. Low-Pressure Compressed Air Piping:

   a. Background: Safety blue.
   b. Letter Colors: White.

2. High-Pressure Compressed Air Piping:

   a. Background: Safety blue.
   b. Letter Colors: White.

3. Domestic Water Piping

   a. Background: Safety green.
   b. Letter Colors: White.

4. Sanitary Waste and Storm Drainage Piping:

   a. Background Color: Safety black.

b. Letter Color: White.

END OF SECTION 220553

SECTION 220719
PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes insulating the following plumbing piping services:

1. Domestic cold-water piping.
2. Domestic hot-water piping.
3. Domestic recirculating hot-water piping.
4. Domestic chilled-water piping for drinking fountains.
5. Sanitary waste piping exposed to freezing conditions.
6. Storm-water piping exposed to freezing conditions.
7. Roof drains and rainwater leaders.
8. Supplies and drains for handicap-accessible lavatories and sinks.

B. Related Sections:

1. Section 22 07 16 "Plumbing Equipment Insulation."

1.3 ACTION SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

1.4 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

C. Mockups: Before installing insulation, build mockups for each type of insulation and finish listed below to demonstrate quality of insulation application and finishes. Build mockups in the

location indicated or, if not indicated, as directed by Architect. Use materials indicated for the completed Work.

1. Piping Mockups:

    a. One 10-foot section of NPS 2 straight pipe.
    b. One each of a 90-degree threaded, welded, and flanged elbow.
    c. One each of a threaded, welded, and flanged tee fitting.
    d. One NPS 2 or smaller valve, and one NPS 2-1/2 or larger valve.
    e. Four support hangers including hanger shield and insert.
    f. One threaded strainer and one flanged strainer with removable portion of insulation.
    g. One threaded reducer and one welded reducer.
    h. One pressure temperature tap.
    i. One mechanical coupling.

2. For each mockup, fabricate cutaway sections to allow observation of application details for insulation materials, adhesives, mastics, attachments, and jackets.
3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
4. Obtain Architect's approval of mockups before starting insulation application.
5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed.

D. Comply with the following applicable standards and other requirements specified for miscellaneous components:

1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. Pittsburgh Corning Corporation.

2. Block Insulation: ASTM C 552, Type I.
3. Special-Shaped Insulation: ASTM C 552, Type III.
4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
5. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Aeroflex USA, Inc.
    b. Armacell LLC.
    c. K-Flex USA.

H. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corporation.
b. Johns Manville; a Berkshire Hathaway company.
c. Knauf Insulation.
d. Manson Insulation Inc.
e. Owens Corning.

I. Mineral-Fiber, Preformed Pipe Insulation:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Johns Manville; a Berkshire Hathaway company.
b. Knauf Insulation.
c. Manson Insulation Inc.
d. Owens Corning.

J. Phenolic:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Kingspan Tarec Industrial Insulation NV.
b. Resolco International BV.

2. Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
3. Block insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type II, Grade 1.
4. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
5. Factory-Applied Jacket: ASJ. Requirements are specified in "Factory-Applied Jackets" Article.

K. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Armacell LLC.
b. Nomaco Insulation.

2.2 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Ramco Insulation, Inc.

B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Ramco Insulation, Inc.

C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Ramco Insulation, Inc.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Foster Brand; H. B. Fuller Construction Products.

C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Aeroflex USA, Inc.
b. Armacell LLC.
c. Foster Brand; H. B. Fuller Construction Products.
d. K-Flex USA.

D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Childers Brand; H. B. Fuller Construction Products.
b. Eagle Bridges - Marathon Industries.
c. Foster Brand; H. B. Fuller Construction Products.
d. Mon-Eco Industries, Inc.

E. Phenolic Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Childers Brand; H. B. Fuller Construction Products.
b. Foster Brand; H. B. Fuller Construction Products.

F. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Eagle Bridges - Marathon Industries.
    c. Foster Brand; H. B. Fuller Construction Products.
    d. Mon-Eco Industries, Inc.

G. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Dow Corning Corporation.
    b. Johns Manville; a Berkshire Hathaway company.
    c. P.I.C. Plastics, Inc.
    d. Speedline Corporation.

2.4 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Foster Brand; H. B. Fuller Construction Products.
    b. Knauf Insulation.
    c. Vimasco Corporation.

2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
5. Color: White.

C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Eagle Bridges - Marathon Industries.
    c. Foster Brand; H. B. Fuller Construction Products.
    d. Mon-Eco Industries, Inc.

2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
3. Service Temperature Range: 0 to 180 deg F.
4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Eagle Bridges - Marathon Industries.
    c. Foster Brand; H. B. Fuller Construction Products.

2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Eagle Bridges - Marathon Industries.
    c. Foster Brand; H. B. Fuller Construction Products.
    d. Knauf Insulation.
    e. Mon-Eco Industries, Inc.
    f. Vimasco Corporation.

2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: 60 percent by volume and 66 percent by weight.
5. Color: White.

2.5 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.
    b. Foster Brand; H. B. Fuller Construction Products.
    c. Vimasco Corporation.

3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
4. Service Temperature Range: 0 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants for Cellular-Glass and Phenolic Products:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Childers Brand; H. B. Fuller Construction Products.
b. Eagle Bridges - Marathon Industries.
c. Foster Brand; H. B. Fuller Construction Products.
d. Mon-Eco Industries, Inc.
e. Pittsburgh Corning Corporation.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.

B. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Childers Brand; H. B. Fuller Construction Products.
b. Eagle Bridges - Marathon Industries.
c. Foster Brand; H. B. Fuller Construction Products.
d. Mon-Eco Industries, Inc.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Childers Brand; H. B. Fuller Construction Products.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.8 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric: Approximately 2 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in. for covering pipe and pipe fittings.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. Childers Brand; H. B. Fuller Construction Products.

B. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for pipe.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Foster Brand; H. B. Fuller Construction Products.
    b. Vimasco Corporation.

2.9 FIELD-APPLIED CLOTHS

A. Woven Glass-Fiber Fabric: Comply with MIL-C-20079H, Type I, plain weave, and presized a minimum of 8 oz./sq. yd..

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. Alpha Associates, Inc.

2.10 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Johns Manville; a Berkshire Hathaway company.
    b. P.I.C. Plastics, Inc.
    c. Proto Corporation.
    d. Speedline Corporation.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: Color as selected by Architect.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

    a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

C. Metal Jacket:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Childers Brand; H. B. Fuller Construction Products.

b. ITW Insulation Systems; Illinois Tool Works, Inc.
c. RPR Products, Inc.

2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.

a. Finish and thickness are indicated in field-applied jacket schedules.
b. Moisture Barrier for Indoor Applications: 1-mil-thick, heat-bonded polyethylene and kraft paper.
c. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
d. Factory-Fabricated Fitting Covers:

1) Same material, finish, and thickness as jacket.
2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
3) Tee covers.
4) Flange and union covers.
5) End caps.
6) Beveled collars.
7) Valve covers.
8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

3. Stainless-Steel Jacket: ASTM A 167 or ASTM A 240/A 240M.

a. Material, finish, and thickness are indicated in field-applied jacket schedules.
b. Moisture Barrier for Indoor Applications: 1-mil-thick, heat-bonded polyethylene and kraft paper.
c. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
d. Factory-Fabricated Fitting Covers:

1) Same material, finish, and thickness as jacket.
2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
3) Tee covers.
4) Flange and union covers.
5) End caps.
6) Beveled collars.
7) Valve covers.
8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

D. Underground Direct-Buried Jacket: 125-mil-thick vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Pittsburgh Corning Corporation.
b. Polyguard Products, Inc.

2.11 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Avery Dennison Corporation, Specialty Tapes Division.
   b. Compac Corporation.
   c. Ideal Tape Co., Inc., an American Biltrite Company.
   d. Knauf Insulation.
   e. Venture Tape.

2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Avery Dennison Corporation, Specialty Tapes Division.
   b. Compac Corporation.
   c. Ideal Tape Co., Inc., an American Biltrite Company.
   d. Knauf Insulation.
   e. Venture Tape.

2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Compac Corporation.
   b. Ideal Tape Co., Inc., an American Biltrite Company.
   c. Venture Tape.

2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.

6. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Avery Dennison Corporation, Specialty Tapes Division.
b. Compac Corporation.
c. Ideal Tape Co., Inc., an American Biltrite Company.
d. Knauf Insulation.
e. Venture Tape.

2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

2.12 SECUREMENTS

A. Bands:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ITW Insulation Systems; Illinois Tool Works, Inc.
b. RPR Products, Inc.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 316; 0.015 inch thick, 1/2 inch] wide with wing seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

C. Wire: 0.062-inch soft-annealed, stainless steel.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. C & F Wire.

2.13 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Engineered Brass Company.
b. Insul-Tect Products Co.
c. McGuire Manufacturing.
d. Plumberex Specialty Products, Inc.

e. Truebro.
f. Zurn Industries, LLC.

2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

B. Protective Shielding Piping Enclosures:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Truebro.
b. Zurn Industries, LLC.

2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

    a. For below-ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

1. Comply with requirements in Section 07 84 13 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.

2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.9 INSTALLATION OF PHENOLIC INSULATION

A. General Installation Requirements:

1. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.
2. Install 2-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with 0.062-inch wire spaced at 12-inch intervals. Secure outer layer with stainless-steel bands at 12-inch intervals.

B. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.

4. For insulation with factory-applied jackets with vapor retarders on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

C. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of same material and thickness as pipe insulation.

D. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

E. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.10 INSTALLATION OF POLYOLEFIN INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Seal split-tube longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyolefin sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of polyolefin pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install cut sections of polyolefin pipe and sheet insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.11 FIELD-APPLIED JACKET INSTALLATION

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.

1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch-thick coats of lagging adhesive.
3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

C. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

D. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.12 FINISHES

A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.13 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.14 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.15 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water:

1. NPS 1 and Smaller: Insulation shall be one of the following:

a. Flexible Elastomeric: 1/2 inch thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
c. Phenolic: 1 inch thick.
d. Polyolefin: 1/2 inch thick.

2. NPS 1-1/4 and Larger: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Phenolic: 1 inch thick.
e. Polyolefin: 1 inch thick.

B. Domestic Hot and Recirculated Hot Water up to Delivery Temperature of 140 degrees:

1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:

a. Flexible Elastomeric: 1 inch thick.
b. Cellular Glass: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Polyolefin: 1 inch thick.

2. NPS 1-1/2 and Larger: Insulation shall be one of the following:

a. Flexible Elastomeric: 1-1/2 inches thick.
b. Cellular Glass: 1-1/2 inches thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inches thick.
d. Polyolefin: 1-1/2 inches thick.

C. Domestic Hot and Recirculated Hot Water Delivery Temperature over 140 degrees to max of 200 degrees:

1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:

a. Flexible Elastomeric: 1-1/2 inches thick.
b. Cellular Glass: 1-1/2 inches thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inches thick.
d. Polyolefin: 1-1/2 inches thick.

2. NPS 1-1/2 and Larger: Insulation shall be one of the following:

a. Flexible Elastomeric: 2 inches thick.
b. Cellular Glass: 2 inches thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.
d. Polyolefin: 2 inches thick.

D. Domestic Chilled Water (Potable):

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Phenolic: 1 inch thick.
e. Polyolefin: 1 inch thick.

E. Stormwater and Overflow:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Phenolic: 1 inch thick.
e. Polyolefin: 1 inch thick.

F. Roof Drain and Overflow Drain Bodies:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Phenolic: 1 inch thick.
e. Polyolefin: 1 inch thick.

G. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Flexible Elastomeric: 3/4 inch thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
c. Polyolefin: 1 inch thick.

H. Sanitary Waste Piping Where Heat Tracing Is Installed:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 2 inches thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1-1/2 inches thick.
c. Phenolic: 1-1/2 inches thick.

I. Floor Drains, Traps, and Sanitary Drain Piping within 10 Feet of Drain Receiving Condensate and Equipment Drain Water below 60 Deg F:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Flexible Elastomeric: 1 inch thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
d. Phenolic: 1 inch thick.
e. Polyolefin: 1 inch thick.

J. Hot Service Drains:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Mineral-Fiber, Preformed Pipe, Type I or II: 1 inch thick.

K. Hot Service Vents:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Mineral-Fiber, Preformed Pipe, Type I or II: 1 inch thick.

3.16 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Domestic Water Piping:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 2 inches thick.
b. Flexible Elastomeric: 2 inches thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.
d. Phenolic: 2 inches thick.
e. Polyolefin: 2 inches thick.

B. Domestic Hot and Recirculated Hot Water:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 2 inches thick.
b. Flexible Elastomeric: 2 inches thick.
c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.
d. Phenolic: 2 inches thick.
e. Polyolefin: 2 inches thick.

C. Sanitary Waste Piping Where Heat Tracing Is Installed:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 2 inches thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.
c. Phenolic: 2 inches thick.

D. Hot Service Drains:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

E. Hot Service Vents:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.
b. Mineral-Fiber, Preformed Pipe Insulation, Type II: 1 inch thick.

3.17 OUTDOOR, UNDERGROUND PIPING INSULATION SCHEDULE

A. Sanitary Waste Piping, All Sizes, Where Heat Tracing Is Installed: Cellular glass, 2 inches thick.

B. Chilled Water, All Sizes: Cellular glass, 2 inches thick.

3.18 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:

1. None.
2. PVC, Color-Coded by System: 30 mils thick.
3. Aluminum, Smooth: 0.016 inch thick.
4. Painted Aluminum, Smooth: 0.016 inch thick.
5. Stainless Steel, Type 316, Smooth 2B Finish: 0.020 inch thick.

D. Piping, Exposed:

1. None.
2. PVC, Color-Coded by System: 30 mils thick.
3. Aluminum: 0.016 inch thick.
4. Painted Aluminum, Smooth: 0.016 inch thick.
5. Stainless Steel, Type 316: 0.020 inch thick.

3.19 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:

1. None.
2. PVC, Color-Coded by System: 20 mils thick.
3. Aluminum, Smooth: 0.016 inch thick.
4. Painted Aluminum, Smooth: 0.016 inch thick.
5. Stainless Steel, Type 316: 0.020 inch thick.

D. Piping, Exposed:

1. PVC: 20 mils thick.
2. Painted Aluminum, Smooth: 0.016 inch thick.
3. Stainless Steel, Type 316: 0.020 inch thick.

3.20 UNDERGROUND, FIELD-INSTALLED INSULATION JACKET

A. For underground direct-buried piping applications, install underground direct-buried jacket over insulation material.

END OF SECTION 22 07 19

SECTION 22 11 13
FACILITY WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies the water distribution piping system, including potable cold, hot, and recirculated hot water piping, fittings, and specialties within the building to a point 5 feet outside the building.

1.3 DEFINITIONS

A. EPDM: Ethylene propylene diene terpolymer rubber.

B. LLDPE: Linear, low-density polyethylene plastic.

C. PA: Polyamide (nylon) plastic.

D. PE: Polyethylene plastic.

E. PP: Polypropylene plastic.

F. PVC: Polyvinyl chloride plastic.

G. RTRF: Reinforced thermosetting resin (fiberglass) fittings.

H. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

1.4 ACTION SUBMITTALS

A. Shop Drawing Data: For each type of product indicated.

1.5 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

E. Codes and Standards:

1. ASTM A 120-84 Specifications for pipe.
2. ASTM B 88-83A Specifications for seamless copper water tube.
3. ANSI B16.4 Fittings, Flanges, and Valves.
4. ANSI B16.22 Fittings, Flanges, and Valves.
5. ASSE 1003 and 1003-1 - Performance Requirements for Water Pressure Reducing Valves.
6. AWWA Cll0-82 Standard for Fittings, Flanges, and Valves.
7. AWWA C600 - Standard for Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances.
8. AWWA C110-82 Standard for Gaskets.
9. AWWA C601 - Standard for Disinfecting Water Mains.
10. PDI WH-201 - Water Hammer Arresters.
11. Plumbing Code Compliance: Comply with applicable portions of BOCA Basic National Plumbing Code.

F. ASME Compliance: Fabricate and stamp pressure - Standards of these Organizations, the more stringent regulations shall govern

1.7 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, and piping according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
3. Store pipe in a manner to prevent sagging and bending.

C. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

D. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

E. Protect flanges, fittings, and specialties from moisture and dirt.

F. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.8 SPARE PARTS

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bibb, or faucet installed.

1.9 COORDINATION

A. Coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

B. Potable-water piping and components shall comply with NSF 14, NSF 61, and NSF 372.

2.2 COPPER TUBE AND FITTINGS

A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.

1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

B. Hard Copper Tube: ASTM B 88, Type K, water tube, drawn temper.

1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

C. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.

D. Copper Unions:

1. MSS SP-123.
2. Cast-copper-alloy, hexagonal-stock body.
3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint or threaded ends.

E. Copper, Brass or Bronze, Pressure-Seal-Joint Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apollo Flow Controls; Conbraco Industries, Inc.
b. Elkhart Products Corporation.
c. Mueller Industries, Inc.
d. NIBCO INC.
e. Viega LLC.

2. Fittings: Cast-brass, cast-bronze, or wrought-copper with EPDM O-ring seal in each end. Sizes NPS 2-1/2 and larger with stainless steel grip ring and EPDM O-ring seal.
3. Minimum 200-psig working-pressure rating at 250 deg F.

2.3 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.

1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
2. Gaskets: AWWA C111, rubber.

C. Grooved-Joint, Ductile-Iron Pipe: AWWA C151, with cut, rounded-grooved ends.

1. Grooved-End, Ductile-Iron Pipe Appurtenances:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Anvil International.
2) Smith-Cooper International.
3) Victaulic Company.

b. Grooved-End, Ductile-Iron Fittings: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions matching pipe.
c. Grooved-End, Ductile-Iron-Piping Couplings: AWWA C606, for ductile-iron-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.

D. Flanges: ASME 16.1, Class 125, cast iron.

2.4 PVC PIPE AND FITTINGS

A. PVC, Schedule 40 Pipe: ASTM D 1785.

1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.

B. PVC, Schedule 80 Pipe: ASTM D 1785.

1. PVC, Schedule 80 Socket Fittings: ASTM D 2467.
2. PVC, Schedule 80 Threaded Fittings: ASTM D 2464.

C. PVC, AWWA Pipe: AWWA C900, with bell end with gasket, and with spigot end.

1. Comply with UL 1285 for fire-service mains if indicated.

2. PVC Fabricated Fittings: AWWA C900, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Gaskets: AWWA C111, rubber.

5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

    a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

2.5 JOINING MATERIALS

A. Copper Tubing: Solder joints in accordance with the procedures specified in ANSI B9.1

B. Brazing Filler Metals: AWS A5.8, BCuP Series.

C. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.6 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

B. Install backflow preventers at each connection to mechanical equipment and systems, and in compliance with the plumbing code and authority having jurisdiction. Locate in same room as equipment being connected. Pipe relief outlet without valves, to nearest floor drain.

C. Install pressure regulating valves with inlet and outlet shutoff valves, and balance cock bypass for domestic booster pump. Install pressure gage on valve outlet.

2.7 CORROSION-PROTECTION PIPING ENCASEMENT

A. Encasement for Underground Metal Piping:

1. Standards: ASTM A 674 or AWWA C105.
2. Material: LLDPE film of 0.008-inch minimum thickness.
3. Material: LLDPE film of 0.008-inch minimum thickness, or high-density, crosslaminated PE film of 0.004-inch minimum thickness.
4. Material: High-density, crosslaminated PE film of 0.004-inch minimum thickness.

2.8 GATE VALVES

A. AWWA, Cast-Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American AVK Co.

b. American Cast Iron Pipe Company.
c. Clow Valve Company; a subsidiary of McWane, Inc.
d. Crane; Crane Energy Flow Solutions.
e. Flomatic Corporation.
f. Kennedy Valve Company; a division of McWane, Inc.
g. M & H Valve Company; a division of McWane, Inc.
h. Mueller Co.
i. NIBCO INC.
j. Tyler Pipe; a subsidiary of McWane Inc.
k. U.S. Pipe and Foundry Company.
l. Zurn Industries, LLC.

2.9 CHECK VALVES

A. AWWA Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American AVK Co.
b. American Cast Iron Pipe Company.
c. APCO Willamette Valve and Primer Corporation.
d. Crane; Crane Energy Flow Solutions.
e. Flomatic Corporation.
f. Kennedy Valve Company; a division of McWane, Inc.
g. M & H Valve Company; a division of McWane, Inc.
h. Mueller Co.
i. NIBCO INC.
j. Stockham; Crane Energy Flow Solutions.
k. WATTS.

2.10 BUTTERFLY VALVES

A. AWWA Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DeZURIK/Copes-Vulcan.
b. Flomatic Corporation.
c. Milliken Valve Company.
d. Milwaukee Valve Company.
e. Mosser Valve.
f. Mueller Co.
g. Pratt, Henry Company.
h. Val-Matic Valve & Manufacturing Corp.

2.11 PLUG VALVES

A. Plug Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DeZURIK/Copes-Vulcan.
b. Homestead Valve.
c. M & H Valve Company; a division of McWane, Inc.
d. Milliken Valve Company.
e. Pratt, Henry Company.
f. Val-Matic Valve & Manufacturing Corp.

2. Description: Resilient-seated eccentric.

a. Standard: MSS SP-108.
b. Body: Cast iron.
c. Pressure Rating: 175-psig minimum CWP.
d. Seat Material: Suitable for potable-water service.

B. Water meters will be furnished by utility company.

2.12 RELIEF VALVES

A. Air-Release Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crispin-Multiplex Manufacturing Co.
b. Flomatic Corporation.
c. GA Industries, Inc.
d. Val-Matic Valve & Manufacturing Corp.

B. Air/Vacuum Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crispin-Multiplex Manufacturing Co.
b. Flomatic Corporation.
c. GA Industries, Inc.
d. Val-Matic Valve & Manufacturing Corp.

2.13 VACUUM BREAKERS

A. Pressure Vacuum Breaker Assembly:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Ames Fire & Waterworks; A WATTS Brand.
b. Apollo Flow Controls; Conbraco Industries, Inc.
c. FEBCO; A WATTS Brand.
d. Flowmatic Corporation.
e. Toro Company (The).
f. WATTS.
g. Wilkins.
h. Zurn Industries, LLC.

2. Standard: ASSE 1020.
3. Accessories: Ball valves on inlet and outlet.

2.14 CONCRETE VAULTS

A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858.

1. Ladder: ASTM A 36/A 36M, steel or polyethylene-encased steel steps.
2. Manhole: ASTM A 48/A 48M Class No. 35A minimum tensile strength, gray-iron traffic frame and cover.

    a. Dimension: 24-inch minimum diameter, unless otherwise indicated.

3. Manhole: ASTM A 536, Grade 60-40-18, ductile-iron traffic frame and cover.

    a. Dimension: 24-inch-minimum diameter, unless otherwise indicated.

4. Drain: ASME A112.6.3, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.

2.15 PROTECTIVE ENCLOSURES

A. Freeze-Protection Enclosures:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. AquaSHIELD.
    b. BF Products Inc.
    c. Dunco Manufacturing, Inc.
    d. Hot Box: Hubbell Power Systems, Inc.
    e. HydroCowl, Inc.
    f. WATTS.

2. Description: Insulated enclosure designed to protect aboveground water piping, equipment, or specialties from freezing and damage, with heat source to maintain minimum internal temperature of 40 deg F when external temperatures reach as low as minus 34 deg F.

    a. Standard: ASSE 1060.
    b. Class I: For equipment or devices other than pressure or atmospheric vacuum breakers.
    c. Class I-V: For pressure or atmospheric vacuum breaker equipment or devices. Include drain opening in housing.

        1) Housing: Reinforced-aluminum construction.

            a) Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
            b) Drain opening for units with drain connection.
            c) Access doors with locking devices.
            d) Insulation inside housing.

e) Anchoring devices for attaching housing to concrete base.

2) Electric heating cable or heater with self-limiting temperature control.

B. Weather-Resistant Enclosures:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AquaSHIELD.
b. BF Products Inc.
c. Dunco Manufacturing, Inc.
d. Hot Box: Hubbell Power Systems, Inc.
e. HydroCowl, Inc.
f. WATTS.

2. Description: Uninsulated enclosure designed to protect aboveground water piping, equipment, or specialties from weather and damage.

a. Standard: ASSE 1060.
b. Class III: For equipment or devices other than pressure or atmospheric vacuum breakers.
c. Class III-V: For pressure or atmospheric vacuum breaker equipment or devices. Include drain opening in housing.

1) Housing: Reinforced-aluminum construction.

a) Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
b) Drain opening for units with drain connection.
c) Access doors with locking devices.
d) Anchoring devices for attaching housing to concrete base.

C. Expanded-Metal Enclosures:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Backflow Prevention Device InnClosures, Inc.
b. BF Products Inc.
c. Cross Brothers Inc.
d. Le Meur Welding & Manufacturing Co.

2. Description: Enclosure designed to protect aboveground water piping, equipment, or specialties from damage.

a. Material: ASTM F 1267, expanded metal side and top panels, of weight and with reinforcement of same metal at edges as required for rigidity.
b. Finish: Manufacturer's enamel paint.
c. Size: Of dimensions indicated, but not less than those required for access and service of protected unit.
d. Locking device.
e. Lugs or devices for securing enclosure to base.

PART 3 - EXECUTION

3.1 PIPING SCHEDULE

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.

C. Do not use flanges or unions for underground piping.

D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

E. Underground water-service piping NPS 3/4 to NPS 3 shall be any of the following:

1. Soft copper tube, ASTM B 88, Type K.
2. PVC, Schedule 80 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.

F. Underground water-service piping NPS 4 to NPS 8 shall be any of the following:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
2. Ductile-iron, piping and joints.
3. PVC, Schedule 80 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.

G. Aboveground Water-Service Piping NPS 3/4 to NPS 3 shall be any of the following:

1. Hard copper tube, ASTM B 88, Type K.
2. PVC, Schedule 80 pipe.

H. Aboveground water-service piping NPS 4 to NPS 8 shall be any of the following:

1. Hard copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
2. Ductile-iron, grooved-end pipe; ductile-iron, grooved-end appurtenances; and grooved joints.
3. PVC, Schedule 80 pipe.

3.2 VALVE APPLICATIONS

A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.

B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, gate valves with valve box.
2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FMG, cast-iron, nonrising-stem gate valves with indicator post.

3. Pressure-Reducing Valves: Use for water-service piping aboveground to control water pressure.
4. Detector Check Valves: Use for water-service piping in vaults and aboveground to detect unauthorized use of water.

3.3 PIPING INSTALLATION

A. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.

B. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.

C. Bury piping with depth of cover over top at least 30 inches with top at least 12 inches level of maximum frost penetration, and according to the following:

1. Under Driveways: With at least 36 inches cover over top.
2. Under Railroad Tracks: With at least 48 inches cover over top.
3. In Loose Gravelly Soil and Rock: With at least 12 inches additional cover.

D. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

E. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

F. See Section 22 11 16 "Domestic Water Piping" for potable-water piping inside the building.

3.4 JOINT CONSTRUCTION

A. Make pipe joints according to the following:

1. Copper-Tubing, Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools and procedures recommended by pressure-seal-fitting manufacturer. Leave insertion marks on pipe after assembly.
2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
4. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
5. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
6. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

3.5 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
2. Locking mechanical joints.
3. Set-screw mechanical retainer glands.
4. Bolted flanged joints.
5. Heat-fused joints.

6. Pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.6 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.

C. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

D. UL/FMG, Valves Other Than Gate Valves: Comply with NFPA 24.

E. MSS Valves: Install as component of connected piping system.

F. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

G. Pressure-Reducing Valves: Install in vault or aboveground between shutoff valves.

H. Relief Valves: Comply with AWWA C512. Install aboveground with shutoff valve on inlet.

3.7 VACUUM BREAKER ASSEMBLY INSTALLATION

A. Install pressure vacuum breaker assemblies of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

B. Do not install pressure vacuum breaker assemblies in vault or other space subject to flooding.

3.8 EQUIPMENT CONNECTIONS

A. Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Plumbing Code.

B. Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated. Provide connection. For connections 2-1/2" and larger, use flanges instead of unions.

3.9 FIELD QUALITY CONTROL

A. Inspections:

1. Do not enclose, cover, or put into operation water distribution piping system until it has been inspected and approved by the authority having jurisdiction.
2. During the progress of the installation, notify the plumbing official having jurisdiction, at least 24 hours prior to the time such inspection must be made. Perform test specified below in the presence of the plumbing official.

    a. Rough-in Inspection: Arrange for inspection of the piping system before concealed or closed-in after system is roughed-in, and prior to setting fixtures.
    b. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to insure compliance with the requirements of the plumbing official.
    c. Reinspection's: Whenever the plumbing official finds that the piping system will not pass the test or inspection, make the required corrections and arrange System Test:

3. Test for leaks and defects all new water distribution piping systems and parts of existing systems, which have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
4. Leave uncovered and unconcealed all new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose all such work for testing that has been covered or concealed before it has been tested and approved.
5. Cap and subject the piping system to a static water pressure of 50 psig above the operating pressure without exceeding the pressure rating of the piping system materials. Isolate the test source and allow to stand for a period of 4 hours. Leaks and loss in test pressure constitute defects which must be repaired.
6. Repair all leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.

3.10 ADJUSTING AND CLEANING

A. Cleaning and Disinfecting:

1. Purge all new water distribution piping systems and parts of existing systems, which have been altered, extended, or repaired prior to use.
2. Use the purging and disinfecting procedure prescribed by the authority having jurisdiction, or in case a method is not prescribed by that authority, the procedure described in either AWWA C601, or AWWA D105, or as described below:

    a. Flush the piping system with clean, potable water until dirty water does not appear at the points of outlet.
    b. Fill the system or part thereof, with a water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) the system, or part thereof, and allow to stand for 24 hours.
    c. Drain the system, or part thereof, of the previous solution, and refill with a water/chlorine solution containing at least 200 parts per million of chlorine and isolate and allow to stand for 3 hours.
    d. Following the allowed standing time, flush the system with clean potable water until chlorine does not remain in the water coming for the system.
    e. Submit water samples in sterile bottles to the authority having jurisdiction. Repeat the procedure if the biological examination made by the authority shows evidence of contamination.

END OF SECTION 22 11 13

SECTION 22 11 16
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Copper tube and fittings.
2. Ductile-iron pipe and fittings.
3. Galvanized steel pipe and fittings.
4. Stainless-steel piping
5. CPVC piping.
6. PVC pipe and fittings.
7. Piping joining materials.
8. Encasement for piping.
9. Transition fittings.
10. Dielectric fittings.

B. Related Requirements:

1. Section 22 11 13 "Facility Water Distribution Piping" for water-service piping outside the building from source to the point where water-service piping enters the building.
2. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.
3. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.3 ACTION SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

B. Potable-water piping and components shall comply with NSF 14, NSF 61, and NSF 372.

2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.

B. Soft Copper Tube: ASTM B 88, Type K water tube, annealed temper.

C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.

D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

F. Copper Unions:

1. MSS SP-123.
2. Cast-copper-alloy, hexagonal-stock body.
3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint or threaded ends.

G. Copper, Brass, or Bronze Pressure-Seal-Joint Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Apollo Flow Controls; Conbraco Industries, Inc.
   b. Elkhart Products Corporation.
   c. Mueller Industries, Inc.
   d. NIBCO INC.
   e. Viega LLC.

2. Fittings: Cast-brass, cast-bronze or wrought-copper with EPDM O-ring seal in each end. Sizes NPS 2-1/2 and larger with stainless steel grip ring and EPDM O-ring seal.
3. Minimum 200-psig working-pressure rating at 250 deg F.

H. Copper Push-on-Joint Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Apollo Flow Controls; Conbraco Industries, Inc.
   b. Elkhart Products Corporation.
   c. NIBCO INC.
   d. Victaulic Company.

2. Description:

   a. Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22.
   b. Stainless-steel teeth and EPDM-rubber, O-ring seal in each end instead of solder-joint ends.

I. Copper-Tube, Extruded-Tee Connections:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

   a. T-DRILL Industries Inc.

2. Description: Tee formed in copper tube according to ASTM F 2014.

J. Appurtenances for Grooved-End Copper Tubing:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Anvil International.
   b. Grinnell Mechanical Products.
   c. Shurjoint Piping Products USA Inc.
   d. Victaulic Company.

2. Bronze Fittings for Grooved-End, Copper Tubing: ASTM B 75/B 75M copper tube or ASTM B 584 bronze castings.
3. Mechanical Couplings for Grooved-End Copper Tubing:

   a. Copper-tube dimensions and design similar to AWWA C606.
   b. Ferrous housing sections.
   c. EPDM-rubber gaskets suitable for hot and cold water.
   d. Bolts and nuts.
   e. Minimum Pressure Rating: 300 psig.

2.3 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Pipe:

1. AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Standard-Pattern, Mechanical-Joint Fittings:

1. AWWA C110/A21.10, ductile or gray iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

C. Compact-Pattern, Mechanical-Joint Fittings:

1. AWWA C153/A21.53, ductile iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

D. Push-on-Joint, Ductile-Iron Pipe:

1. AWWA C151/A21.51.
2. Push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.

E. Standard-Pattern, Push-on-Joint Fittings:

1. AWWA C110/A21.10, ductile or gray iron.
2. Gaskets: AWWA C111/A21.11, rubber.

F. Compact-Pattern, Push-on-Joint Fittings:

1. AWWA C153/A21.53, ductile iron.

2. Gaskets: AWWA C111/A21.11, rubber.

G. Plain-End, Ductile-Iron Pipe: AWWA C151/A21.51.

H. Appurtenances for Grooved-End, Ductile-Iron Pipe:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Shurjoint Piping Products USA Inc.
b. Smith-Cooper International.
c. Star Pipe Products.
d. Victaulic Company.

2. Fittings for Grooved-End, Ductile-Iron Pipe: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions that match pipe.
3. Mechanical Couplings for Grooved-End, Ductile-Iron-Piping:

a. AWWA C606 for ductile-iron-pipe dimensions.
b. Ferrous housing sections.
c. EPDM-rubber gaskets suitable for hot and cold water.
d. Bolts and nuts.

2.4 GALVANIZED-STEEL PIPE AND FITTINGS

A. Galvanized-Steel Pipe:

1. ASTM A 53/A 53M, Standard Weight.
2. Include ends matching joining method.

B. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Standard Weight, seamless steel pipe with threaded ends.

C. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

D. Malleable-Iron Unions:

1. ASME B16.39, Class 150.
2. Hexagonal-stock body.
3. Ball-and-socket, metal-to-metal, bronze seating surface.
4. Threaded ends.

E. Flanges: ASME B16.1, Class 125, cast iron.

F. Appurtenances for Grooved-End, Galvanized-Steel Pipe:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International.
b. Grinnell Mechanical Products.
c. Shurjoint Piping Products USA Inc.
d. Victaulic Company.

2. Fittings for Grooved-End, Galvanized-Steel Pipe: Galvanized, ASTM A 47/A 47M, malleable-iron casting; ASTM A 106/A 106M, steel pipe; or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
3. Fittings for Grooved-End, Galvanized-Steel Pipe:

    a. AWWA C606 for steel-pipe dimensions.
    b. Ferrous housing sections.
    c. EPDM-rubber gaskets suitable for hot and cold water.
    d. Bolts and nuts.

2.5 CPVC PIPING

A. CPVC Pipe: ASTM F 441/F 441M, Schedule 80.

1. CPVC Socket Fittings: ASTM F 439 for Schedule 80.
2. CPVC Threaded Fittings: ASTM F 437, Schedule 80.

B. CPVC Piping System: ASTM D 2846/D 2846M, SDR 11, pipe and socket fittings.

C. CPVC Tubing System: ASTM D 2846/D 2846M, SDR 11, tube and socket fittings.

2.6 PVC PIPE AND FITTINGS

A. PVC Pipe: ASTM D 1785, Schedule 80.

B. PVC Socket Fittings: ASTM D 2467 for Schedule 80.

C. PVC Schedule 80 Threaded Fittings: ASTM D 2464.

2.7 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials:

1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys.

D. Flux: ASTM B 813, water flushable.

E. Brazing Filler Metals: AWS A5.8M/A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

F. Solvent Cements for Joining CPVC Piping and Tubing: ASTM F 493.

G. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.8 ENCASEMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105/A21.5.

2.9 TRANSITION FITTINGS

A. General Requirements:

1. Same size as pipes to be joined.
2. Pressure rating at least equal to pipes to be joined.
3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

C. Sleeve-Type Transition Coupling: AWWA C219.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cascade Waterworks Mfg. Co.
b. Dresser, Inc.
c. Ford Meter Box Company, Inc. (The).
d. Jay R. Smith Mfg. Co.
e. JCM Industries, Inc.
f. Romac Industries, Inc.
g. Smith-Blair, Inc.
h. Viking Johnson.

D. Plastic-to-Metal Transition Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Charlotte Pipe and Foundry Company.
b. Harvel Plastics, Inc.
c. Spears Manufacturing Company.
d. Uponor.

2. Description:

a. CPVC or PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
b. One end with threaded brass insert and one solvent-cement-socket or threaded end.

E. Plastic-to-Metal Transition Unions:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Colonial Engineering, Inc.
b. NIBCO INC.
c. Spears Manufacturing Company.

2. Description:

a. CPVC or PVC four-part union.

b. Brass or stainless-steel threaded end.
c. Solvent-cement-joint or threaded plastic end.
d. Rubber O-ring.
e. Union nut.

2.10 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. A.Y. McDonald Mfg. Co.
b. Capitol Manufacturing Company.
c. Central Plastics Company.
d. HART Industrial Unions, LLC.
e. Jomar Valve.
f. Matco-Norca.
g. WATTS.
h. Wilkins.
i. Zurn Industries, LLC.

2. Standard: ASSE 1079.
3. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Capitol Manufacturing Company.
b. Central Plastics Company.
c. Matco-Norca.
d. WATTS.
e. Wilkins.
f. Zurn Industries, LLC.

2. Standard: ASSE 1079.
3. Factory-fabricated, bolted, companion-flange assembly.
4. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Insulating Kits:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Central Plastics Company.
d. Pipeline Seal and Insulator, Inc.

2. Nonconducting materials for field assembly of companion flanges.
3. Gasket: Neoprene or phenolic.
4. Bolt Sleeves: Phenolic or polyethylene.
5. Washers: Phenolic with steel backing washers.

E. Dielectric Nipples:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Elster Perfection Corporation.
   b. Grinnell Mechanical Products.
   c. Matco-Norca.
   d. Precision Plumbing Products.
   e. Victaulic Company.

2. Standard: IAPMO PS 66.
3. Electroplated steel nipple complying with ASTM F 1545.
4. End Connections: Male threaded or grooved.
5. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."

C. Install ductile-iron piping under building slab with restrained joints according to AWWA C600 and AWWA M41.

D. Install underground copper tube and ductile-iron pipe in PE encasement according to ASTM A 674 or AWWA C105/A21.5.

E. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Section 22 05 19 "Meters and Gages for Plumbing Piping" and with requirements for drain valves and strainers in Section 22 11 19 "Domestic Water Piping Specialties."

F. Install shutoff valve immediately upstream of each dielectric fitting.

G. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements for pressure-reducing valves in Section 22 11 19 "Domestic Water Piping Specialties."

H. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

I. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

J. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

K. Install piping to permit valve servicing.

L. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

M. Install piping free of sags and bends.

N. Install fittings for changes in direction and branch connections.

O. Install PEX tubing with loop at each change of direction of more than 90 degrees.

P. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

Q. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump and provide booster pump by-pass.

R. Install thermostats in hot-water circulation piping. Comply with requirements for thermostats in Section 22 11 23 "Domestic Water Pumps."

S. Install thermometers on inlet and outlet piping from each water heater. Comply with requirements for thermometers in Section 22 05 19 "Meters and Gages for Plumbing Piping."

T. Install sleeves for piping penetrations of walls, ceilings, and floors.

U. Install sleeve seals for piping penetrations of concrete walls and slabs.

V. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.2 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.

E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools and procedure recommended by pressure-seal-fitting manufacturer. Leave insertion marks on pipe after assembly.

G. Push-on Joints for Copper Tubing: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.

H. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

I. Joint Construction for Grooved-End Copper Tubing: Make joints according to AWWA C606. Roll groove ends of tubes. Lubricate and install gasket over ends of tubes or tube and fitting. Install coupling housing sections over gasket with keys seated in tubing grooves. Install and tighten housing bolts.

J. Joint Construction for Grooved-End, Ductile-Iron Piping: Make joints according to AWWA C606. Cut round-bottom grooves in ends of pipe at gasket-seat dimension required for specified (flexible or rigid) joint. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.

K. Joint Construction for Grooved-End Steel Piping: Make joints according to AWWA C606. Groove ends of pipe as specified. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.

L. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

M. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
3. PVC Piping: Join according to ASTM D 2855.

N. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.3 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Fittings in Underground Domestic Water Piping:

1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
2. Fittings for NPS 2 and Larger: Sleeve-type coupling.

C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition.

3.4 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings or nipples and unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.

D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.5 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:

1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
3. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
4. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.6 IDENTIFICATION

A. Identify system components. Comply with requirements for identification materials and installation in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

B. Label pressure piping with system operating pressure.

3.7 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Piping Inspections:

a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.

c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

2. Piping Tests:

a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.8 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.

a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.9 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:

    a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    b. Fill and isolate system according to either of the following:

        1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
        2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

    c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
    d. Repeat procedures if biological examination shows contamination.
    e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.10 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Under-building-slab, domestic water, building-service piping, NPS 3 and smaller, shall be one of the following:

1. Soft copper tube, ASTM B 88, Type K.
2. PVC, Schedule 80; socket fittings; and solvent-cemented joints.

E. Under-building-slab, domestic water, building-service piping, NPS 4 to NPS 8 and larger, shall be one of the following:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
2. Mechanical-joint, ductile-iron pipe; standard- or compact-pattern, mechanical-joint fittings; and mechanical joints.
3. Push-on-joint, ductile-iron pipe; standard- or compact-pattern, push-on-joint fittings; and gasketed joints.
4. Plain-end, ductile-iron pipe; grooved-joint, ductile-iron-pipe appurtenances; and grooved joints.
5. PVC, Schedule 80; socket fittings; and solvent-cemented joints.

F. Under-building-slab, combined domestic water, building-service, NPS 6 to NPS 12, shall be one of the following:

1. Mechanical-joint, ductile-iron pipe; standard- or compact-pattern, mechanical-joint fittings; and mechanical joints.
2. Push-on-joint, ductile-iron pipe; standard- or compact-pattern, push-on-joint fittings; and gasketed joints.
3. Plain-end, ductile-iron pipe; grooved-joint, ductile-iron-pipe appurtenances; and grooved joints.

G. Under-building-slab, domestic water piping, NPS 2 and smaller, shall be one of the following:

1. Copper tube, ASTM B 88, Type L.
2. PVC, Schedule 80; socket fittings; and solvent-cemented joints.

H. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:

1. Galvanized-steel pipe and nipples; galvanized, gray-iron threaded fittings; and threaded joints.
2. Hard copper tube, ASTM B 88, Type L; solder-joint fittings; and soldered joints.
3. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
4. Hard copper tube, ASTM B 88, Type L; copper push-on-joint fittings; and push-on joints.
5. CPVC, Schedule 80; socket fittings; and solvent-cemented joints.
6. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.
7. CPVC Tubing System: CPVC tube; CPVC socket fittings; and solvent-cemented joints. NPS 1-1/2 and NPS 2 CPVC pipe with CPVC socket fittings may be used instead of tubing.
8. PVC, Schedule 80; socket fittings; and solvent-cemented joints.

I. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L; solder-joint fittings; and soldered joints.
2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
3. Hard copper tube, ASTM B 88, Type L; grooved-joint, copper-tube appurtenances; and grooved joints.
4. Galvanized-steel pipe and nipples; galvanized, gray-iron threaded fittings; and threaded joints.
5. Galvanized-steel pipe; grooved-joint, galvanized-steel-pipe appurtenances; and grooved joints.
6. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.
7. PVC, Schedule 80; socket fittings; and solvent-cemented joints.

3.11 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
3. Hot-Water Circulation Piping, Balancing Duty: Balancing valves.
4. Drain Duty: Hose-end drain valves.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION 22 11 16

SECTION 22 11 19
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Vacuum breakers.
2. Automatic water shutoff valves.
3. Balancing valves.
4. Temperature-actuated, water mixing valves.
5. Strainers.
6. Hose bibbs.
7. Wall hydrants.
8. Drain valves.
9. Water-hammer arresters.
10. Air vents.
11. Trap-seal primer valves.
12. Trap-seal primer systems.
13. Flexible connectors.

1.3 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced

1.4 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

A. Potable-water piping and components shall comply with NSF 61.

B. Comply with NSF 372 for low lead.

2.2 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Ames Fire & Waterworks; A WATTS Brand.
    b. Apollo Flow Controls; Conbraco Industries, Inc.
    c. FEBCO; A WATTS Brand.
    d. WATTS.
    e. Zurn Industries, LLC.

2. Standard: ASSE 1001.
3. Size: NPS 1/4 to NPS 3, as required to match connected piping.
4. Body: Bronze.
5. Inlet and Outlet Connections: Threaded.

B. Hose-Connection Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Apollo Flow Controls; Conbraco Industries, Inc.
    b. MIFAB, Inc.
    c. WATTS.
    d. Woodford Manufacturing Company.
    e. Zurn Industries, LLC.

2. Standard: ASSE 1011.
3. Body: Bronze, nonremovable, with manual drain.
4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.

C. Pressure Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Ames Fire & Waterworks; A WATTS Brand.
    b. Apollo Flow Controls; Conbraco Industries, Inc.
    c. FEBCO; A WATTS Brand.
    d. WATTS.
    e. Zurn Industries, LLC.

2. Standard: ASSE 1020.

D. Water-Control Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Standard.
    b. Apollo Flow Controls; Conbraco Industries, Inc.
    c. CLA-VAL Automatic Control Valves.
    d. Flomatic Corporation.
    e. OCV Control Valves.
    f. WATTS.
    g. Zurn Industries, LLC.

2. Description: Pilot-operated, diaphragm-type, single-seated, main water-control valve.
3. Pressure Rating: Initial working pressure of 150 psig minimum with AWWA C550 or FDA-approved, interior epoxy coating. Include small pilot-control valve, restrictor device, specialty fittings, and sensor piping.
4. Main Valve Body: Cast- or ductile-iron body with AWWA C550 or FDA-approved, interior epoxy coating; or stainless-steel body.

2.4 AUTOMATIC WATER SHUTOFF VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. DynaQuip Controls.
2. FloLogic, Inc.
3. OnSite PRO Inc.
4. QMI Manufacturing Inc.
5. Reliance Detection Technologies.

B. Standards: NSF 61 and NSF 372.

C. Shutoff Control Ball Valve:

1. Control Valve: Two-piece, full-port brass ball valve, MSS SP-110.

a. End Connections: Threaded, female.
b. Seats: PTFE.
c. O-Rings: FKM.
d. Stem: Low lead brass. Blowout proof.

2. Manual override control turn-knob for emergency operation of the valve.

D. Shutoff Control Butterfly Valve:

1. Compliance: MSS SP-67.
2. Full-port, epoxy-coated, ductile-iron lug body.
3. Seat: EPDM, minus 30 deg F to plus 250 deg F.
4. Face-to-Face Flange: ASME B16.5 flanges.
5. Disc Design: Floating stainless-steel dual shaft.
6. Locating Pin: Carbon steel.
7. Bushings: PTFE.
8. O-Rings: EPDM.
9. Ten position stop.
10. Manual override control turn-knob for emergency operation of the valve.

2.5 BALANCING VALVES

A. Copper-Alloy Calibrated Balancing Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Circuit Solver, Therm omega tech.
b. NIBCO INC.
c. TACO Comfort Solutions, Inc.

d. WATTS.

2. Type: Ball valve with two readout ports and memory-setting indicator.
3. Size: Same as connected piping, but not larger than NPS 2.
4. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

2.6 TEMPERATURE-ACTUATED, WATER MIXING VALVES

A. Water-Temperature Limiting Devices:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Armstrong International, Inc.
   b. Leonard Valve Company.
   c. POWERS; A WATTS Brand.
   d. Symmons Industries, Inc.
   e. TACO Comfort Solutions, Inc.
   f. WATTS.
   g. Zurn Industries, LLC.

2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig.
4. Type: Thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded inlets and outlet.
7. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

B. Primary, Thermostatic, Water Mixing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Acorn Engineering Company.
   b. Armstrong International, Inc.
   c. Lawler Manufacturing Company, Inc.
   d. Leonard Valve Company.
   e. POWERS; A WATTS Brand.
   f. Zurn Industries, LLC.

2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Type: Thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded inlets and outlet.
7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

C. Manifold, Thermostatic, Water Mixing-Valve Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Leonard Valve Company.
b. POWERS; A WATTS Brand.
c. Symmons Industries, Inc.

2. Description: Factory-fabricated, thermostatically controlled.
3. Large-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
4. Intermediate-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
5. Small-Flow Parallel: Thermostatic, water mixing valve.
6. Thermostatic Mixing Valves: Comply with ASSE 1017. Include check stops on hot- and cold-water inlets and shutoff valve on outlet.
7. Water Regulator(s): Comply with ASSE 1003. Include pressure gage on inlet and outlet.
8. Pressure Rating: 125 psig minimum unless otherwise indicated.
9. Cabinet: Factory fabricated, stainless steel, for mounting and with hinged, stainless-steel door.

D. Individual-Fixture, Water Tempering Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Lawler Manufacturing Company, Inc.
b. Leonard Valve Company.
c. POWERS; A WATTS Brand.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASSE 1016, thermostatically controlled, water tempering valve.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze body with corrosion-resistant interior components.
5. Temperature Control: Adjustable.
6. Inlets and Outlet: Threaded.
7. Finish: Rough or chrome-plated bronze.

2.7 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

1. Pressure Rating: 125 psig minimum unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved, epoxy coated and for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations unless otherwise indicated.

2.8 HOSE BIBBS

A. Hose Bibbs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.

c. WATTS.
d. Woodford Manufacturing Company.
e. Zurn Industries, LLC.

2. Standard: ASME A112.18.1 for sediment faucets.
3. Body Material: Bronze.
4. Seat: Bronze, replaceable.
5. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
6. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
7. Pressure Rating: 125 psig.
8. Vacuum Breaker: Integral or field-installation, nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
9. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
10. Operation for Equipment Rooms: Wheel handle or operating key.
11. Include operating key with each operating-key hose bibb.

2.9 WALL HYDRANTS

A. Nonfreeze Wall Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jay R. Smith Mfg. Co.
b. Josam Company.
c. MIFAB, Inc.
d. WATTS.
e. Woodford Manufacturing Company.
f. Zurn Industries, LLC.

2. Standard: ASME A112.21.3M, self-draining wall hydrants.
3. Pressure Rating: 125 psig.
4. Operation: Loose key.
5. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
6. Inlet: NPS 3/4 or NPS 1.
7. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
8. Box: Deep, flush mounted with cover.
9. Outlet: Exposed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
10. Operating Keys(s): Two with each wall hydrant.

B. Nonfreeze, Hot- and Cold-Water Wall Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jay R. Smith Mfg. Co.
b. Josam Company.
c. WATTS.
d. Woodford Manufacturing Company.
e. Zurn Industries, LLC.

2. Standard: ASME A112.21.3M, self-draining wall hydrants.

3. Pressure Rating: 125 psig.
4. Operation: Loose key.
5. Casing and Operating Rods: Of length required to match wall thickness. Include wall clamps.
6. Inlet: NPS 3/4 or NPS 1.
7. Outlet: Concealed.
8. Box: Deep, flush mounted with cover.
9. Vacuum Breaker:

    a. Nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.
    b. Garden-hose thread complying with ASME B1.20.7 on outlet.

10. Operating Key(s): Two with each wall hydrant.

C. Vacuum Breaker Wall Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Jay R. Smith Mfg. Co.
    b. WATTS.
    c. Woodford Manufacturing Company.
    d. Zurn Industries, LLC.

2. Standard: ASSE 1019, Type A or Type B.
3. Type: Freeze-resistant, automatic draining with integral air-inlet valve.
4. Classification: Type A, for automatic draining with hose removed or Type B, for automatic draining with hose removed or with hose attached and nozzle closed.
5. Pressure Rating: 125 psig.
6. Operation: Loose key.
7. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
8. Inlet: NPS 1/2 or NPS 3/4.
9. Outlet: Exposed with garden-hose thread complying with ASME B1.20.7.

2.10 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. AMTROL, Inc.
    b. Josam Company.
    c. MIFAB, Inc.
    d. Precision Plumbing Products.
    e. Sioux Chief Manufacturing Company, Inc.
    f. WATTS.
    g. Zurn Industries, LLC.

2. Standard: ASSE 1010 or PDI-WH 201.
3. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.11 AIR VENTS

A. Bolted-Construction Automatic Air Vents:

1. Body: Bronze.
2. Pressure Rating and Temperature: 125-psig minimum pressure rating at 140 deg F.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Inlet and Vent Outlet End Connections: Threaded.

B. Welded-Construction Automatic Air Vents:

1. Body: Stainless steel.
2. Pressure Rating: 150-psig minimum pressure rating.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

2.12 TRAP-SEAL PRIMER DEVICE

A. Drainage-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. MIFAB
   b. WATTS
   c. PROSET

2. Standard: ASSE 1044, lavatory P-trap with NPS 3/8 minimum, trap makeup connection.
3. Size: NPS 1-1/4 minimum.
4. Material: Chrome-plated, cast brass.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Water Control Valves: Install with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.

B. Balancing Valves: Install in locations where they can easily be adjusted.

C. Temperature-Actuated, Water Mixing Valves: Install with check stops or shutoff valves on inlets and with shutoff valve on outlet.

1. Install cabinet-type units recessed in or surface mounted on wall as specified.

D. Y-Pattern Strainers: For water, install on supply side of each control valve, solenoid valve, and pump.

E. Water-Hammer Arresters: Install in water piping according to PDI-WH 201.

F. Air Vents: Install vents at high points of water piping

G. Drainage-Type, Trap-Seal Primer Device: Install as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.

H. Trap-Seal Primer Systems: Install with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.

3.2 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping specialties adjacent to equipment and machines, allow space for service and maintenance.

C. Comply with requirements for grounding equipment in Section 26 05 26 "Grounding and Bonding for Electrical Systems."

3.3 IDENTIFICATION

A. Plastic Labels for Equipment: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

1. Pressure vacuum breakers.
2. Automatic water shutoff valves.
3. Primary, thermostatic, water mixing valves.
4. Manifold, thermostatic, water mixing-valve assemblies.
5. Primary water tempering valves.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test each valve according to authorities having jurisdiction and the device's reference standard.

B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow set points of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION 22 11 19

SECTION 22 13 16
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Hub-and-spigot, cast-iron soil pipe and fittings.
2. Hubless, cast-iron soil pipe and fittings.
3. Ductile-iron pipe and fittings.
4. PVC pipe and fittings.
5. Specialty pipe fittings.
6. Encasement for underground metal piping.

B. Related Requirements:

1. Section 22 13 13 "Facility Sanitary Sewers" for sanitary sewerage piping and structures outside the building.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced

1.5 FIELD CONDITIONS

A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of sanitary waste service.
2. Do not proceed with interruption of sanitary waste service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

1. Soil, Waste, and Vent Piping: 10-foot head of water.

B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 PIPING MATERIALS

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.3 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74.

B. Gaskets: ASTM C 564, rubber.

C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.4 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. Single-Stack Aerator Fittings: ASME B16.45, hubless, cast-iron aerator and deaerator drainage fittings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Conine Manufacturing Co., Inc.
    b. SE Sovent.

C. CISPI, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. ANACO-Husky.
    b. Charlotte Pipe and Foundry Company.
    c. Dallas Specialty & Mfg. Co.
    d. Fernco Inc.
    e. Josam Company.
    f. Matco-Norca.
    g. MIFAB, Inc.
    h. Mission Rubber Company, LLC; a division of MCP Industries.
    i. NewAge Casting.
    j. Stant.
    k. Tyler Pipe; a subsidiary of McWane Inc.

2. Standards: ASTM C 1277 and CISPI 310.
3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

D. Heavy-Duty, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. ANACO-Husky.
   b. Charlotte Pipe and Foundry Company.
   c. Clamp-All Corp.
   d. Dallas Specialty & Mfg. Co.
   e. MIFAB, Inc.
   f. Mission Rubber Company, LLC; a division of MCP Industries.
   g. NewAge Casting.
   h. Stant.
   i. Tyler Pipe; a subsidiary of McWane Inc.

2. Standards: ASTM C 1277 and ASTM C 1540.
3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

E. Cast-Iron, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Charlotte Pipe and Foundry Company.
   b. MG Piping Products Company.

2. Standard: ASTM C 1277.
3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.5 DUCTILE-IRON PIPE AND FITTINGS

A. Ductile-Iron, Mechanical-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot ends unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Ductile-Iron, Push-on-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with push-on-joint bell and plain spigot ends unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, push-on-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Gaskets: AWWA C111/A21.11, rubber.

C. Ductile-Iron, Grooved-Joint Piping: AWWA C151/A21.51, with round-cut-grooved ends according to AWWA C606.

D. Ductile-Iron, Grooved-End Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Anvil International.
   b. Shurjoint Piping Products USA Inc.
   c. Smith-Cooper International.
   d. Star Pipe Products.
   e. Victaulic Company.

2. Grooved-End, Ductile-Iron Fittings: ASTM A 536 ductile-iron castings, with dimensions matching AWWA C110/A 21.10 ductile-iron pipe or AWWA C153/A 21.53 ductile-iron fittings, and complying with AWWA C606 for grooved ends.
3. Grooved Mechanical Couplings for Ductile-Iron Pipe: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber center-leg gasket suitable for hot and cold water; and bolts and nuts.

2.6 PVC PIPE AND FITTINGS

A. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

B. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.

C. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

D. Adhesive Primer: ASTM F 656.

E. Solvent Cement: ASTM D 2564.

2.7 SPECIALTY PIPE FITTINGS

A. Transition Couplings:

1. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
2. Unshielded, Nonpressure Transition Couplings:

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Dallas Specialty & Mfg. Co.
      2) Fernco Inc.
      3) Froet Industries LLC.
      4) Mission Rubber Company, LLC; a division of MCP Industries.
      5) Plastic Oddities.

   b. Standard: ASTM C 1173.
   c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

d. End Connections: Same size as and compatible with pipes to be joined.
e. Sleeve Materials:

1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

3. Shielded, Nonpressure Transition Couplings:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Cascade Waterworks Mfg. Co.
2) Mission Rubber Company, LLC; a division of MCP Industries.

b. Standard: ASTM C 1460.
c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
d. End Connections: Same size as and compatible with pipes to be joined.

4. Pressure Transition Couplings:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Apollo Flow Controls; Conbraco Industries, Inc.
2) Cascade Waterworks Mfg. Co.
3) Dresser, Inc.
4) EBAA Iron, Inc.
5) Ford Meter Box Company, Inc. (The).
6) Jay R. Smith Mfg. Co.
7) JCM Industries, Inc.
8) Romac Industries, Inc.
9) Viking Johnson.

b. Standard: AWWA C219.
c. Description: Metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
d. Center-Sleeve Material: Manufacturer's standard.
e. Gasket Material: Natural or synthetic rubber.
f. Metal Component Finish: Corrosion-resistant coating or material.

B. Dielectric Fittings:

1. Dielectric Unions:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) A.Y. McDonald Mfg. Co.
2) Capitol Manufacturing Company.
3) Central Plastics Company.

4) HART Industrial Unions, LLC.
5) Jomar Valve.
6) Matco-Norca.
7) WATTS.
8) Wilkins.
9) Zurn Industries, LLC.

b. Description:

1) Standard: ASSE 1079.
2) Pressure Rating: 250 psig.
3) End Connections: Solder-joint copper alloy and threaded ferrous.

2. Dielectric Flanges:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Capitol Manufacturing Company.
2) Central Plastics Company.
3) Matco-Norca.
4) WATTS.
5) Wilkins.
6) Zurn Industries, LLC.

b. Description:

1) Standard: ASSE 1079.
2) Factory-fabricated, bolted, companion-flange assembly.
3) Pressure Rating: 300 psig.
4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

3. Dielectric-Flange Insulating Kits:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Advance Products & Systems, Inc.
2) Calpico, Inc.
3) Central Plastics Company.
4) Pipeline Seal and Insulator, Inc.

b. Description:

1) Nonconducting materials for field assembly of companion flanges.
2) Pressure Rating: 150 psig.
3) Gasket: Neoprene or phenolic.
4) Bolt Sleeves: Phenolic or polyethylene.
5) Washers: Phenolic with steel backing washers.

4. Dielectric Nipples:

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Elster Perfection Corporation.
      2) Grinnell Mechanical Products.
      3) Josam Company.
      4) Matco-Norca.
      5) Precision Plumbing Products.
      6) Victaulic Company.

   b. Description:

      1) Standard: IAPMO PS 66.
      2) Electroplated steel nipple.
      3) Pressure Rating: 300 psig at 225 deg F.
      4) End Connections: Male threaded or grooved.
      5) Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.

   1. The design drawings are generally diagrammatic. They do not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work is necessary to avoid conflicts.
   2. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.
   3. Install piping as indicated unless deviations to layout are approved on coordination drawings.
   4. PVC piping, fittings and other PVC materials shall not be installed in air conditioning plenums or equipment rooms used as air conditioning plenums.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends.

1. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical.
2. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe.

    a. Straight tees, elbows, and crosses may be used on vent lines.

3. Do not change direction of flow more than 90 degrees.
4. Use proper size of standard increasers and reducers if pipes of different sizes are connected.

    a. Reducing size of waste piping in direction of flow is prohibited.

K. Lay buried building waste piping beginning at low point of each system.

1. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream.
2. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
3. Maintain swab in piping and pull past each joint as completed.

L. Install soil and waste and vent piping at the following minimum slopes unless otherwise indicated:

1. Building Sanitary Waste: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
2. Horizontal Sanitary Waste Piping: 2 percent downward in direction of flow.
3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.

N. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."

O. Install aboveground PVC piping according to ASTM D 2665.

P. Install underground PVC piping according to ASTM D 2321.

Q. Install engineered soil and waste and vent piping systems as follows:

1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
2. Hubless, Single-Stack Drainage System: Comply with ASME B16.45 and hubless, single-stack aerator fitting manufacturer's written installation instructions.
3. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.

R. Install underground, ductile-iron, force-main piping according to AWWA C600.

1. Install buried piping inside building between wall and floor penetrations and connection to sanitary sewer piping outside building with restrained joints.
2. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
3. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.

S. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."

1. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.

T. Install force mains at elevations indicated.

U. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.2 JOINT CONSTRUCTION

A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

B. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum calked joints.

C. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1.

1. Cut threads full and clean using sharp dies.
2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

    a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
    c. Do not use pipe sections that have cracked or open welds.

E. Join stainless-steel pipe and fittings with gaskets according to ASME A112.3.1.

F. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.

G. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.

H. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

I. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 appendixes.
3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 appendixes.

3.3 VALVE INSTALLATION

A. Comply with requirements in Section 22 05 23.12 "Ball Valves for Plumbing Piping," Section 22 05 23.13 "Butterfly Valves for Plumbing Piping," Section 22 05 23.14 "Check Valves for Plumbing Piping," and Section 22 05 23.15 "Gate Valves for Plumbing Piping" for general-duty valve installation requirements.

B. Shutoff Valves:

1. Install shutoff valve on each sewage pump discharge.
2. Install gate or full-port ball valve for piping NPS 2 and smaller.
3. Install gate valve for piping NPS 2-1/2 and larger.

C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves
2. Floor Drains: Drain outlet backwater valves unless drain has integral backwater valve.
3. Install backwater valves in accessible locations.
4. Comply with requirements for backwater valve specified in Section 22 13 19 "Sanitary Waste Piping Specialties."

3.4 HANGER AND SUPPORT INSTALLATION

A. Vertical Piping shall be supported at its base and no greater than every story height, not to exceed 20 foot intervals.

B. Horizontal Piping (Suspended) shall be supported at each bend; at not more than five (5) foot intervals; except that pipe exceeding five (5) feet in length may be supported at not more than ten (10) foot intervals. Supports shall be adequate to maintain alignment and prevent sagging and shall be made directly behind the bell or coupling, where possible, not near the center of the pipe.

C. Supports shall be connected to the building structure not from other equipment, ducts or conduits.

D. Horizontal pipe and fittings six inches and larger shall be suitably braced to prevent horizontal movement. This should be done at every branch opening or change of direction by the use of braces, blocks, rodding or other suitable method, to prevent movement.

E. Where components are suspended in excess of eighteen inches by means of non-rigid hangers, they should be suitably braced against movement horizontally, often called sway bracing.

3.5 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect waste and vent piping to the following:

1. Plumbing Fixtures: Connect waste piping in sizes indicated, but not smaller than required by plumbing code.
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
3. Plumbing Specialties: Connect waste and vent piping in sizes indicated, but not smaller than required by plumbing code.
4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
5. Install horizontal backwater valves with cleanout cover flush with floor.
6. Comply with requirements for backwater valves, cleanouts, and drains specified in Section 22 13 19 "Sanitary Waste Piping Specialties."
7. Equipment: Connect waste piping as indicated.

    a. Provide shutoff valve if indicated and union for each connection.
    b. Use flanges instead of unions for connections NPS 2-1/2 and larger.

D. Connect force-main piping to the following:

1. Sanitary Sewer: To exterior force main.
2. Sewage Pump: To sewage pump discharge.

E. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

F. Make connections according to the following unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.6 IDENTIFICATION

A. Identify exposed sanitary waste and vent piping.

B. Comply with requirements for identification specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.7 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Test sanitary waste and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.

    a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced waste and vent piping until it has been tested and approved.

    a. Expose work that was covered or concealed before it was tested.

3. Roughing-in Plumbing Test Procedure: Test waste and vent piping except outside leaders on completion of roughing-in.

    a. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water.
    b. From 15 minutes before inspection starts to completion of inspection, water level must not drop.
    c. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight.

    a. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg.
    b. Use U-tube or manometer inserted in trap of water closet to measure this pressure.
    c. Air pressure must remain constant without introducing additional air throughout period of inspection.
    d. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

D. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved.

    a. Expose work that was covered or concealed before it was tested.

2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials.

    a. Isolate test source and allow to stand for four hours.
    b. Leaks and loss in test pressure constitute defects that must be repaired.

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

3.8 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect sanitary waste and vent piping during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

E. Repair damage to adjacent materials caused by waste and vent piping installation.

3.9 PIPING SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.

B. Aboveground, soil and waste piping NPS 3 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings and hubless, single-stack aerator fittings; CISPI hubless-piping couplings; and coupled joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

C. Aboveground, soil and waste piping NPS 4 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings and hubless, single-stack aerator fittings; CISPI hubless-piping couplings; and coupled joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

D. Aboveground, vent piping NPS 3 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; hubless-piping couplings; and coupled joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

E. Aboveground, vent piping NPS 4 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; hubless-piping couplings; and coupled joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

F. Underground, soil, waste, and vent piping NPS 3 and smaller shall be any of the following:

1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; hubless-piping couplings; and coupled joints.
3. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

G. Underground, soil and waste piping NPS 4 and larger shall be any of the following:

1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; hubless-piping couplings; coupled joints.
3. Solid-wall PVC pipe; PVC socket fittings; and solvent-cemented joints.

H. Aboveground sanitary-sewage force mains NPS 1-1/2 and NPS 2 shall be the following:

1. Galvanized-steel pipe, pressure fittings, and threaded joints.

I. Aboveground sanitary-sewage force mains NPS 2-1/2 to NPS 6 shall be the following:

1. Grooved-end, galvanized-steel pipe; grooved-joint, galvanized-steel-pipe appurtenances; and grooved joints.

J. Underground sanitary-sewage force mains NPS 4 and smaller shall be any of the following:

1. Hard copper tube, Type L; copper pressure fittings; and soldered joints.
2. Ductile-iron, mechanical-joint piping and mechanical joints.
3. Ductile-iron, push-on-joint piping and push-on joints.
4. Ductile-iron, grooved-joint piping and grooved joints.
5. Fitting-type transition coupling for piping smaller than NPS 1-1/2 and pressure transition coupling for NPS 1-1/2 and larger if dissimilar pipe materials.

K. Underground sanitary-sewage force mains NPS 5 and larger shall be any of the following:

1. Hard copper tube, Type L; copper pressure fittings; and soldered joints.
2. Ductile-iron, mechanical-joint piping and mechanical joints.
3. Ductile-iron, push-on-joint piping and push-on joints.
4. Ductile-iron, grooved-joint piping and grooved joints.
5. Pressure transition couplings if dissimilar pipe materials.

END OF SECTION 22 13 16

SECTION 22 13 19
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. FOG disposal systems.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene.

B. PVC: Polyvinyl chloride.

C. Ductile - Iron

1.4 ACTION SUBMITTALS

A. Shop Drawings: Submit manufacturer's data for review before any work is commenced

1.5 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.6 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Data: For FOG disposal systems, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sanitary waste piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTIONS

A. Sanitary waste piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14 for plastic sanitary waste piping specialty components.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing, and marked for intended location and application.

2.2 BACKWATER VALVES

A. Horizontal, Cast-Iron Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Josam Company.
    b. MIFAB, Inc.
    c. WATTS.
    d. Zurn Industries, LLC.

2. Standard: ASME A112.14.1.
3. Size: Same as connected piping.
4. Body: Cast iron.
5. Cover: Cast iron with access to check valve.
6. Type Check Valve: Removable, bronze, swing check, factory assembled.
7. Extension: ASTM A 74, Service class; full-size, cast-iron, soil-pipe extension to field-installed cleanout at floor; replaces backwater valve cover.

B. Drain-Outlet Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Josam Company.
    b. WATTS.
    c. Zurn Industries, LLC.

2. Size: Same as floor drain outlet.
3. Body: Cast iron or bronze made for vertical installation in bottom outlet of floor drain.
4. Check Valve: Removable ball float.
5. Inlet: Threaded.
6. Outlet: Threaded or spigot.

2.3 CLEANOUTS

A. Cast-Iron Exposed Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Tyler Pipe; a subsidiary of McWane Inc.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M.
3. Size: Same as connected drainage piping
4. Body Material: As required to match connected piping.
5. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Cast-Iron Exposed Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jay R. Smith Mfg. Co.
b. Josam Company.
c. Oatey.
d. Sioux Chief Manufacturing Company, Inc.
e. Tyler Pipe; a subsidiary of McWane Inc.
f. WATTS.
g. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M for cleanout.
3. Size: Same as connected branch.
4. Body or Ferrule: Cast iron.
5. Clamping Device: Required.
6. Outlet Connection: Threaded.
7. Adjustable Housing Material: Cast iron with threads.
8. Frame and Cover Shape: Round.
9. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. WATTS.
d. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure Plug:

a. Countersunk head.
b. Drilled and threaded for cover attachment screw.
c. Size: Same as or not more than one size smaller than cleanout size.

6. Wall Access: Round, chrome-plated or stainless-steel cover plate with screw.
7. Wall Access: Round, wall-installation frame and cover.

2.4 AIR-ADMITTANCE VALVES

A. Fixture Air-Admittance Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Studor, Inc.

2. Standard: ASSE 1051, Type A for single fixture or Type B for branch piping.
3. Housing: Plastic.
4. Operation: Mechanical sealing diaphragm.
5. Size: Same as connected fixture or branch vent piping.

B. Stack Air-Admittance Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Studor, Inc.

2. Standard: ASSE 1050 for vent stacks.
3. Housing: Plastic.
4. Operation: Mechanical sealing diaphragm.
5. Size: Same as connected stack vent or vent stack.

C. Wall Box for Air-Admittance Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Studor, Inc.

2. Description: White plastic housing with white plastic grille, made for recessed installation. Include bottom pipe connection and space to contain one air-admittance valve.
3. Size: About 9 inches wide by 8 inches high by 4 inches deep.

2.5 ROOF FLASHING ASSEMBLIES

A. Roof Flashing Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Acorn Engineering Company.
    b. Thaler Metal Industries Ltd.
    c. Zurn Industries, LLC.

2. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch- thick, lead flashing collar and skirt extending at least 6 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.

    a. Open-Top Vent Cap: Without cap.
    b. Low-Silhouette Vent Cap: With vandal-proof vent cap.

c. Extended Vent Cap: With field-installed, vandal-proof vent cap.

2.6 THROUGH-PENETRATION FIRESTOP ASSEMBLIES

A. Through-Penetration Firestop Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

   a. ProSet Systems Inc.

2. Standard: UL 1479 assembly of sleeve-and-stack fitting with firestopping plug.
3. Size: Same as connected soil, waste, or vent stack.
4. Sleeve: Molded-PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
5. Stack Fitting: ASTM A 48/A 48M, gray-iron, hubless-pattern wye branch with neoprene O-ring at base and gray-iron plug in thermal-release harness. Include PVC protective cap for plug.
6. Special Coating: Corrosion resistant on interior of fittings.

2.7 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564 rubber gaskets.
2. Size: Same as connected waste piping.

B. Deep-Seal Traps:

1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.

   a. NPS 2: 4-inch-minimum water seal.
   b. NPS 2-1/2 and Larger: 5-inch-minimum water seal.

C. Floor-Drain, Trap-Seal Primer Fittings:

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 side inlet.

D. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

E. Sleeve Flashing Device:

1. Description: Manufactured, cast-iron fitting, with clamping device that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

F. Stack Flashing Fittings:

1. Description: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
2. Size: Same as connected stack vent or vent stack.

G. Vent Caps:

1. Description: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

H. Expansion Joints:

1. Standard: ASME A112.6.4.
2. Body: Cast iron with bronze sleeve, packing, and gland.
3. End Connections: Matching connected piping.
4. Size: Same as connected soil, waste, or vent piping.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install backwater valves in building drain piping.

1. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.

B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate at base of each vertical soil and waste stack.

C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

E. Install fixture air-admittance valves on fixture drain piping.

F. Install stack air-admittance valves at top of stack vent and vent stack piping.

G. Install air-admittance-valve wall boxes recessed in wall.

H. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof. Comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."

I. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof. Comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."

J. Install deep-seal traps on floor drains and other waste outlets, if indicated.

K. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.

1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
2. Size: Same as floor drain inlet.

L. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

M. Install sleeve and sleeve seals with each riser and stack passing through floors with waterproof membrane.

N. Install vent caps on each vent pipe passing through roof.

O. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

P. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.

Q. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

3.2 CONNECTIONS

A. Comply with requirements in Section 22 13 16 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.3 FLASHING INSTALLATION

A. Comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."

B. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required.

C. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

D. Set flashing on floors and roofs in solid coating of bituminous cement.

E. Secure flashing into sleeve and specialty clamping ring or device.

F. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 07 62 00 "Sheet Metal Flashing and Trim."

G. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

3.4 LABELING AND IDENTIFYING

A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.

1. Nameplates and signs are specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 13 19

SECTION 22 13 19.13
SANITARY DRAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Floor drains.
2. Floor sinks.

1.3 DEFINITIONS

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced

1.5 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

PART 2 - PRODUCTS

2.1 DRAIN ASSEMBLIES

A. Sanitary drains shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14 for plastic sanitary piping specialty components.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Josam Company.
    b. MIFAB, Inc.
    c. WATTS.
    d. Zurn Industries, LLC.

2. Standard: ASME A112.6.3

B. Stainless-Steel Floor Drains, ASME A112.3.1

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Zurn Industries, LLC.

C. Stainless-Steel Floor Drains, ASME A112.6.3

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jay R. Smith Mfg. Co.
b. Josam Company.
c. Sioux Chief Manufacturing Company, Inc.
d. WATTS.
e. Zurn Industries, LLC.

2.3 FLOOR SINKS

A. Cast-Iron Floor Sinks

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. Wade; a subsidiary of McWane Inc.
c. Watts; a Watts Water Technologies company.
d. Zurn Industries, LLC.

2. Standard: ASME A112.6.7.

B. Stainless-Steel Floor Sinks, ASME A112.6.7:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. Watts; a Watts Water Technologies company.
c. Zurn Industries, LLC.

2. Standard: ASME A112.6.7.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.

1. Position floor drains for easy access and maintenance.
2. Set floor drains below elevation of surrounding finished floor to allow floor drainage.

3. Set with grates depressed according to the following drainage area radii:

    a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
    b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
    c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.

4. Install floor-drain flashing collar or flange, so no leakage occurs between drain and adjoining flooring.

    a. Maintain integrity of waterproof membranes where penetrated.

5. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

3.2 CONNECTIONS

A. Comply with requirements in Section 22 13 16 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Comply with requirements in Section 22 13 19 "Sanitary Waste Piping Specialties" for backwater valves, air admittance devices and miscellaneous sanitary drainage piping specialties.

C. Install piping adjacent to equipment to allow service and maintenance.

3.3 LABELING AND IDENTIFYING

A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.5 TRAP PRIMERS

A. Trap primer outlet should extend vertically a minimum of 12" before a change in direction to horizontal is made. The horizontal line to the trap primer connection shall be installed sloping to the trap it serves. Provide a minimum size of 12" x 12" stainless steel access cover for each trap primer.

END OF SECTION 22 13 19.13

SECTION 22 14 13
FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications

1.3 SUMMARY

A. Section Includes:

1. Hub-and-spigot, cast-iron soil pipe and fittings.
2. Hubless, cast-iron soil pipe and fittings.
3. Ductile-iron pipe and fittings.
4. PVC pipe and fittings.
5. Specialty pipe and fittings.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

1.5 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.6 FIELD CONDITIONS

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

1. Storm Drainage Piping: 10-foot head of water.
2. Storm Drainage, Force-Main Piping: 150 psig

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AB & I Foundry; a part of the McWane family of companies.
2. Charlotte Pipe and Foundry Company.
3. NewAge Casting.
4. Tyler Pipe; a part of McWane family of companies.

B. Pipe and Fittings:

1. Marked with CISPI collective trademark and NSF certification mark.
2. Class: ASTM A 74, **Service** class.

C. Gaskets: ASTM C 564, rubber.

D. Caulking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AB & I Foundry; a part of the McWane family of companies.
2. Charlotte Pipe and Foundry Company.
3. NewAge Casting.
4. Tyler Pipe; a part of McWane family of companies.

B. Pipe and Fittings:

1. Marked with CISPI collective trademark and NSF certification mark.
2. Standard: ASTM A 888 or CISPI 301.

C. CISPI, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ANACO-Husky.
b. Charlotte Pipe and Foundry Company.
c. Dallas Specialty & Mfg. Co.
d. Fernco Inc.
e. Ideal Clamp Products, Inc.
f. Matco-Norca.
g. MIFAB, Inc.
h. Mission Rubber Company, LLC; a division of MCP Industries.
i. NewAge Casting.
j. Tyler Pipe; a subsidiary of McWane Inc.

2. Couplings shall bear CISPI collective trademark and NSF certification mark.
3. Standards: ASTM C 1277 and CISPI 310.
4. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

D. Heavy-Duty, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ANACO-Husky.
b. Charlotte Pipe and Foundry Company.
c. Clamp-All Corp.
d. Dallas Specialty & Mfg. Co.

e. Ideal Clamp Products, Inc.
f. MIFAB, Inc.
g. Mission Rubber Company, LLC; a division of MCP Industries.
h. NewAge Casting.
i. Tyler Pipe; a subsidiary of McWane Inc.

2. Standard: ASTM C 1540.
3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

E. Cast-Iron, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Charlotte Pipe and Foundry Company.
b. MG Piping Products Company.

2. Standard: ASTM C 1277.
3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 DUCTILE-IRON PIPE AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Ductile Iron Pipe.
2. McWane Ductile.
3. U.S. Pipe and Foundry Company.

B. Ductile-Iron, Mechanical-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

C. Ductile-Iron, Push-on-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, push-on-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Gaskets: AWWA C111/A21.11, rubber.

D. Ductile-Iron, Grooved-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with round-cut-grooved ends according to AWWA C606.

2. Ductile-Iron, Grooved-End Pipe Appurtenances:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Anvil International.
2) Shurjoint Piping Products USA Inc.
3) Smith-Cooper International.
4) Star Pipe Products.
5) Victaulic Company.

b. Grooved-End, Ductile-Iron Fittings: ASTM A 536, ductile-iron castings with dimensions matching AWWA C110/A21.10, ductile-iron pipe or AWWA C153/A21.53, ductile-iron fittings; complying with AWWA C606 for grooved ends.

c. Grooved Mechanical Couplings for Ductile-Iron Pipe: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber center-leg gasket suitable for hot and cold water; and bolts and nuts.

2.5 PVC PIPE AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Charlotte Pipe and Foundry Company.
2. GF Piping Systems.
3. JM Eagle.
4. Mueller Industries, Inc.
5. National Pipe and Plastic, Inc.
6. North America Pipe Corporation.
7. Rocky Mountain Colby Pipe Company.
8. Silver-line Plastics.

B. NSF Marking: Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic storm drain and "NSF-sewer" for plastic storm sewer piping.

C. Solid-Wall PVC Pipe: ASTM D 2665; drain, waste, and vent.

D. Use of PVC in return air plenums (i.e., office area) and through fire rated assemblies will not be permitted.

E. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.

F. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

G. Adhesive Primer: ASTM F 656.

H. Solvent Cement: ASTM D 2564.

2.6 SPECIALTY PIPE FITTINGS

A. Transition Couplings:

1. General Requirements: Fitting or device for joining piping with small differences in ODs or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified-piping-system fitting.
3. Unshielded, Nonpressure Transition Couplings:

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Dallas Specialty & Mfg. Co.
        2) Fernco Inc.
        3) Mission Rubber Company, LLC; a division of MCP Industries.
        4) Plastic Oddities.

    b. Standard: ASTM C 1173.
    c. Description: Elastomeric sleeve, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
    d. Sleeve Materials:

        1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
        2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
        3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

4. Shielded, Nonpressure Transition Couplings:

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Cascade Waterworks Mfg. Co.
        2) Mission Rubber Company, LLC; a division of MCP Industries.

    b. Standard: ASTM C 1460.
    c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
    d. End Connections: Same size as and compatible with pipes to be joined.

5. Pressure Transition Couplings:

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Cascade Waterworks Mfg. Co.
        2) EBAA Iron, Inc.
        3) Ford Meter Box Company, Inc. (The).
        4) JCM Industries, Inc.
        5) Romac Industries, Inc.

    b. Standard: AWWA C219.
    c. Description: Metal, sleeve-type couplings same size as pipes to be joined, and with pressure rating at least equal to and ends compatible with pipes to be joined.

d. Gasket Material: Natural or synthetic rubber.
e. Metal Component Finish: Corrosion-resistant coating or material.

B. Dielectric Fittings:

1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) A.Y. McDonald Mfg. Co.
2) Capitol Manufacturing Company.
3) Central Plastics Company.
4) HART Industrial Unions, LLC.
5) Jomar Valve.
6) Matco-Norca.
7) WATTS.
8) Zurn Industries, LLC.

b. Description:

1) Standard: ASSE 1079.
2) Pressure Rating: 150 psig minimum at 180 deg F.
3) End Connections: Solder-joint copper alloy and threaded ferrous.

3. Dielectric Flanges:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Central Plastics Company.
2) Matco-Norca.
3) WATTS.
4) Zurn Industries, LLC.

b. Description:

1) Standard: ASSE 1079.
2) Factory-fabricated, bolted, companion-flange assembly.
3) Pressure Rating: 150 psig minimum at 180 deg F.
4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

4. Dielectric-Flange Insulating Kits:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Advance Products & Systems, Inc.
2) Calpico, Inc.
3) Central Plastics Company.

4) GPT; an EnPro Industries company.

b. Description:

1) Nonconducting materials for field assembly of companion flanges.
2) Pressure Rating: 150 psig
3) Gasket: Neoprene or phenolic.
4) Bolt Sleeves: Phenolic or polyethylene.
5) Washers: Phenolic with steel-backing washers.

5. Dielectric Nipples:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Grinnell Mechanical Products.
2) Matco-Norca.
3) Precision Plumbing Products.
4) Victaulic Company.

b. Description: Electroplated steel nipple.
c. Standard: IAPMO PS 66.
d. Pressure Rating: 300 psig at 225 deg F.
e. End Connections: Male threaded or grooved.
f. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.

1. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.
2. Install piping as indicated unless deviations from layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Use of PVC in return air plenums (i.e., office area) and through fire rated assemblies will not be permitted.

K. Make changes in direction for piping using appropriate branches, bends, and long-sweep bends.

1. Do not change direction of flow more than 90 degrees.
2. Use proper size of standard increasers and reducers if pipes of different sizes are connected.

a. Reducing size of drainage piping in direction of flow is prohibited.

L. Lay buried building piping beginning at low point of each system.

1. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream.
2. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
3. Maintain swab in piping and pull past each joint as completed.

M. Install piping at the following minimum slopes unless otherwise indicated:

1. Building Storm Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
2. Horizontal Storm Drainage Piping: 2 percent downward in direction of flow.

N. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.

O. Install aboveground PVC piping according to ASTM D 2665.

P. Install underground PVC piping according to ASTM D 2321.

Q. Install underground, ductile-iron, force-main piping according to AWWA C600.

1. Install buried piping inside building between wall and floor penetrations and connection to storm sewer piping outside building with restrained joints.
2. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
3. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.

R. Install force mains at elevations indicated.

S. Plumbing Specialties:

1. Install backwater valves in storm drainage gravity-flow piping.

a. Comply with requirements for backwater valves specified in Section 22 14 23 "Storm Drainage Piping Specialties."

2. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers in storm drainage gravity-flow piping.

    a. Install cleanout fitting with closure plug inside the building in storm drainage force-main piping.
    b. Comply with requirements for cleanouts specified in Section 22 14 23 "Storm Drainage Piping Specialties."

3. Install drains in storm drainage gravity-flow piping.

    a. Comply with requirements for drains specified in Section 22 14 23 "Storm Drainage Piping Specialties."

T. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

U. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.2 JOINT CONSTRUCTION

A. Hub-and-Spigot, Cast-Iron Soil Piping Gasketed Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

B. Hub-and-Spigot, Cast-Iron Soil Piping Caulked Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum caulked joints.

C. Hubless, Cast-Iron Soil Piping Coupled Joints:

1. Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1.

1. Cut threads full and clean using sharp dies.
2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

    a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
    c. Do not use pipe sections that have cracked or open welds.

E. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fittings. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.

F. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

G. Plastic, Nonpressure-Piping, Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 appendices.

H. Joint Restraints and Sway Bracing:

1. Provide joint restraints and sway bracing for storm drainage piping joints to comply with the following conditions:

   a. Provide axial restraint for pipe and fittings 5 inches and larger, upstream and downstream of all changes in direction, branches, and changes in diameter greater than two pipe sizes.
   b. Provide rigid sway bracing for pipe and fittings 4 inches and larger, upstream and downstream of all changes in direction 45 degrees and greater.
   c. Provide rigid sway bracing for pipe and fittings 5 inches and larger, upstream and downstream of all changes in direction and branch openings.

3.3 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in ODs.
2. In Drainage Piping: nonpressure transition couplings.
3. In Aboveground Force-Main Piping: Fitting-type transition couplings.
4. In Underground Force-Main Piping:

   a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
   b. NPS 2 and Larger: Pressure transition couplings.

B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples.
3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.
4. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.4 VALVE INSTALLATION

A. General valve installation requirements for general-duty valve installations are specified in the following Sections:

1. Section 22 05 23.12 "Ball Valves for Plumbing Piping."
2. Section 22 05 23.13 "Butterfly Valves for Plumbing Piping."
3. Section 22 05 23.14 "Check Valves for Plumbing Piping."
4. Section 22 05 23.15 "Gate Valves for Plumbing Piping."

B. Shutoff Valves:

1. Install shutoff valve on each sump pump discharge.
2. Install full port ball valve for piping NS 2 and smaller.
3. Install gate valve for piping NPS 2-1/2 and larger.

C. Check Valves: Install swing-check valve, between pump and shutoff valve, on each sump pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves
2. Install backwater valves in accessible locations.
3. Comply with requirements for backwater valves specified in Section 22 14 23 "Storm Drainage Piping Specialties."

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hanger and support devices and installation specified in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steelpipe hangers for horizontal piping in noncorrosive environments.
2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.
3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
5. Vertical Piping: MSS Type 8 or Type 42, clamps.
6. Install individual, straight, horizontal piping runs:

    a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.

7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
8. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Support horizontal piping and tubing within 12 inches of each fitting, valve**,** and coupling.

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3: 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
5. NPS 10 and NPS 12: 60 inches with 7/8-inch rod.
6. Spacing for 10-foot pipe lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.

F. Install supports for vertical cast-iron soil piping every 15 feet.

G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
2. NPS 3: 48 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
5. NPS 10 and NPS 12: 48 inches with 7/8-inch rod.

H. Install supports for vertical PVC piping every 48 inches.

I. Support piping and tubing not listed above according to MSS SP-58 and manufacturer's written instructions.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.

C. Connect storm drainage piping to roof drains and storm drainage specialties.

1. Install test tees (wall cleanouts) in conductors near floor, and floor cleanouts with cover flush with floor.
2. Install horizontal backwater valves in pit with pit cover flush with floor.
3. Comply with requirements for backwater valves, cleanouts and drains specified in Section 22 14 23 "Storm Drainage Piping Specialties."

D. Where installing piping adjacent to equipment, allow space for service and maintenance.

E. Make connections according to the following unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

A. Identify exposed storm drainage piping.

B. Comply with requirements for identification specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.

a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved.

    a. Expose work that was covered or concealed before it was tested.

3. Test Procedure:

    a. Test storm drainage piping on completion of roughing-in.
    b. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.

4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
5. Prepare reports for tests and required corrective action.

C. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved.

    a. Expose work that was covered or concealed before it was tested.

2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials.

    a. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
4. Prepare reports for tests and required corrective action.

D. Piping will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.9 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PIPING SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.

B. Aboveground storm drainage piping NPS 6 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless, cast-iron soil pipe and fittings; CISPI, hubless-piping couplings; and coupled joints.
3. Galvanized-steel pipe, drainage fittings, and threaded joints.
4. Copper Type DWV tube, copper drainage fittings, and soldered joints.
5. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
6. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
7. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

C. Aboveground, storm drainage piping NPS 8 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; heavy-duty, hubless-piping couplings; and coupled joints.
3. Galvanized-steel pipe, drainage fittings, and threaded joints.
4. Copper Type DWV tube, copper drainage fittings, and soldered joints.
5. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

D. Underground storm drainage piping NPS 6 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; cast-iron, hubless-piping couplings; and coupled joints.
3. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
4. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
5. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

E. Underground, storm drainage piping NPS 8 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
2. Hubless, cast-iron soil pipe and fittings; cast-iron, hubless-piping couplings; and coupled joints.
3. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
4. Cellular-core, sewer and drain series, PVC pipe; PVC socket fittings; and solvent-cemented joints.
5. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

END OF SECTION 22 14 13

SECTION 22 14 23
STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.3 SUMMARY

A. Section Includes:

1. Metal roof drains.
2. Miscellaneous storm drainage piping specialties.
3. Cleanouts.
4. Backwater valves.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

1.5 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Drains shall be of the type and materials as scheduled on the drawings.

B. Provide all necessary bolts, clamping rings and appurtenances to effect a complete installation.

C. Roof drain bearing pan where required shall be by roof drain manufacturer.

2.2 METAL ROOF DRAINS

A. Cast-Iron, Large-Sump, General-Purpose Roof Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Wade; a subsidiary of McWane Inc.
d. WATTS.

e. Zurn Industries, LLC.

2. Standard: ASME A112.6.4.
3. Body Material: Cast iron.

B. Cast-Iron, Medium-Sump, General-Purpose Roof Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. Marathon Roofing Products.
c. MIFAB, Inc.
d. Wade; a subsidiary of McWane Inc.
e. WATTS.
f. Zurn Industries, LLC.

2. Standard: ASME A112.6.4.
3. Body Material: Cast iron.

C. Cast-Iron, Small-Sump, General-Purpose Roof Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Wade; a subsidiary of McWane Inc.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASME A112.6.4.
3. Body Material: Cast iron.

D. Metal, Medium-Sump, Deck Roof Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Wade; a subsidiary of McWane Inc.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASME A112.6.4.
3. Body Material: Cast iron.

2.3 MISCELLANEOUS STORM DRAINAGE PIPING SPECIALTIES

A. Conductor Nozzles:

1. Description: Bronze body with threaded inlet and bronze wall flange with mounting holes.
2. Size: Same as connected conductor.

2.4 CLEANOUTS

A. Cast-Iron Exposed Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Josam Company.
    b. MIFAB, Inc.
    c. Wade; a subsidiary of McWane Inc.
    d. WATTS.
    e. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M.
3. Size: Same as connected branch.
4. Closure Plug Size: Same as, or not more than, one size smaller than cleanout size.

B. Cast-Iron Exposed Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Josam Company.
    b. Oatey.
    c. Sioux Chief Manufacturing Company, Inc.
    d. Wade; a subsidiary of McWane Inc.
    e. WATTS.
    f. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M.
3. Size: Same as connected branch.

C. Plastic Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Canplas LLC.
    b. IPS Corporation.
    c. NDS Inc.
    d. Plastic Oddities.
    e. Sioux Chief Manufacturing Company, Inc.
    f. Zurn Industries, LLC.

2. Size: Same as connected branch.
3. Body Material: PVC.
4. Closure Plug: PVC.
5. Riser: Drainage pipe fitting and riser to cleanout of same material as drainage piping.

D. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Wade; a subsidiary of McWane Inc.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.

E. Test Tees:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. WATTS.
d. Zurn Industries, LLC.

2. Standard: ASME A112.36.2M and ASTM A 74, ASTM A 888, or CISPI 301.
3. Size: Same as connected drainage piping.
4. Body Material: Hub-and-spigot, cast-iron soil-pipe T-branch or no-hub, cast-iron soil-pipe test tee as required to match connected piping.
5. Closure Plug Size: Same as, or not more than, one size smaller than cleanout size.

2.5 BACKWATER VALVES

A. Cast-Iron, Horizontal Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. MIFAB, Inc.
c. Wade; a subsidiary of McWane Inc.
d. WATTS.
e. Zurn Industries, LLC.

2. Standard: ASME A112.14.1.
3. Size: Same as connected piping.
4. Body Material: Cast iron.
5. Cover: Cast iron with access check valve.
6. Check Valve: Removable, bronze, swing check, factory assembled or field modified Extension: ASTM A 74, Service class; full-size, cast-iron soil-pipe extension to field-installed cleanout at floor; replaces backwater valve cover.

B. Cast-Iron, Drain-Outlet Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Josam Company.
b. WATTS.
c. Zurn Industries, LLC.

2. Standard: ASME A112.14.1.
3. Size: Same as floor drain outlet.
4. Body Material: Cast iron or bronze made for vertical installation in bottom outlet of floor drain.
5. Check Valve: Removable ball float.
6. Inlet: Threaded.
7. Outlet: Threaded or spigot.

C. Plastic, Horizontal Backwater Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Canplas LLC.
   b. IPS Corporation.
   c. NDS Inc.
   d. Oatey.
   e. Plastic Oddities.
   f. Sioux Chief Manufacturing Company, Inc.
   g. Zurn Industries, LLC.

2. Standard: ASME A112.14.1.
3. Size: Same as connected piping.
4. Body Material: PVC.
5. Cover: Same material as body with threaded access to check valve.
6. Check Valve: Removable swing check.
7. End Connections: Socket type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.

1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
2. Install expansion joints, if indicated, in roof drain outlets.
3. Position roof drains for easy access and maintenance.

B. Install conductor nozzles at exposed bottom of conductors where they spill onto grade.

C. Install cleanouts in aboveground piping and building drain piping according to the following instructions unless otherwise indicated:

1. Use cleanouts the same size as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate cleanouts at each change in direction of piping greater than 45 degrees.
3. Locate cleanouts at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate cleanouts at base of each vertical storm piping conductor.

D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

F. Install horizontal backwater valves in floor with cover flush with floor.

G. Install drain-outlet backwater valves in outlet of drains.

H. Use of PVC in return air plenums (i.e., office area) and through fire rated assemblies will not be permitted.

I. Install test tees in vertical conductors and near floor.

J. Install wall cleanouts in vertical conductors. Install access door in wall if indicated.

K. Install through-penetration firestop assemblies for penetrations of fire- and smoke-rated assemblies.

3.2 CONNECTIONS

A. Comply with requirements for piping specified in Section 22 14 13 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

3.3 FLASHING INSTALLATION

A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 14 23

SECTION 22 14 29
SUMP PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submersible sump pumps.
2. Sump-pump basins.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

A. Manufacturer's Literature and Data:

1. Pump:

a. Manufacturer and model.
b. Operating speed.
c. Capacity.
d. Characteristic performance curves.

B. Certified copies of all the factory and construction site test data sheets and reports.

C. Complete operating and maintenance manuals including wiring diagrams, technical data sheets and information for ordering replaceable parts:

1. Include complete list which indicates all components of the system.
2. Include complete diagrams of the internal wiring for each item of equipment.
3. Diagrams shall have their terminals identified to facilitate installation, operation and maintenance.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping flange protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.

C. Comply with manufacturer's written instructions for handling.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. UL Compliance: Comply with UL 778 for motor-operated water pumps.

2.2 SUBMERSIBLE SUMP PUMPS

A. Submersible, Fixed-Position, Single-Seal Sump Pumps

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Stancor, Inc.
    b. Liberty Pumps.
    c. Grundfos Pumps Corp
    d. Zoeller Company.

2. Description: Factory-assembled and -tested sump-pump unit.
3. Pump Type: Submersible, end-suction, single-stage, close-coupled, overhung-impeller, centrifugal sump pump as defined in HI 1.1-1.2 and HI 1.3.
4. Pump Casing: Cast iron, with strainer inlet, legs that elevate pump to permit flow into impeller, and vertical discharge for piping connection.
5. Impeller: Statically and dynamically balanced, ASTM A 532/A 532M, abrasion-resistant cast iron, design for clear wastewater handling, and keyed and secured to shaft.
6. Pump and Motor Shaft: Stainless steel or steel, with factory-sealed, grease-lubricated ball bearings.
7. Seal: Mechanical.
8. Motor: Hermetically sealed, capacitor-start type; with built-in overload protection; lifting eye or lug; and three-conductor, waterproof power cable of length required and with grounding plug and cable-sealing assembly for connection at pump.
9. Controls:

    a. Enclosure: NEMA 250, Type 4X.
    b. Switch Type: Pedestal-mounted float switch with float rods and rod buttons.
    c. Automatic Alternator: Start pumps on successive cycles and start multiple pumps if one cannot handle load.
    d. Float Guides: Pipe or other restraint for floats and rods in basins of depth greater than 60 inches.
    e. High-Water Alarm: Cover-mounted, compression-probe alarm, with electric bell; 120 V ac, with transformer and contacts for remote alarm bell.

10. Control-Interface Features:

    a. Remote Alarm Contacts: For remote alarm interface.
    b. Building Automation System Interface: Auxiliary contacts in pump controls for interface to building automation system and capable of providing the following:

        1) On-off status of pump.
        2) Alarm status.

2.3 SUMP-PUMP CAPACITIES AND CHARACTERISTICS

A. Unit Capacity: Min of 50 gpm per elevator

2.4 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 22 05 13 "Common Motor Requirements for Plumbing Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

B. Motors for submersible pumps shall be hermetically sealed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for plumbing piping to verify actual locations of storm drainage piping connections before sump pump installation.

3.2 INSTALLATION

A. Pump Installation Standards: Comply with HI 1.4 for installation of sump pumps.

B. Sump: Provided by others. Minimum of 24” (length) x 24” (width) x 24” (depth) concrete basin in the elevator pit.

C. Provide a check and ball valve in the discharge of each pump.

3.3 CONNECTIONS

A. Comply with requirements for piping specified in Section 22 14 13 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to equipment, allow space for service and maintenance.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test, inspect, and adjust components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections:

1. Perform each visual and mechanical inspection.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Pumps and controls will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

E. Adjust pumps to function smoothly, and lubricate as recommended by manufacturer.

F. Adjust control set points.

END OF SECTION 22 14 29

SECTION 22 33 00
ELECTRIC, DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.3 SUMMARY

A. Section Includes:

1. Commercial, electric, storage, domestic-water heaters.
2. Commercial, light-duty, storage, electric, domestic-water heaters.
3. Domestic-water heater accessories.

1.4 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Commercial domestic-water heaters shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified.

1.5 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects."

1.7 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including storage tank and supports.
b. Faulty operation of controls.
c. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Periods: From date of Substantial Completion.

a. Commercial, Electric, Storage, Domestic-Water Heaters:

1) Storage Tank: Five years.
2) Controls and Other Components: Five years.

b. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:

1) Storage Tank: Five years.
2) Controls and Other Components: Three years.

c. Compression Tanks: Five years.

PART 2 - PRODUCTS

2.1 COMMERCIAL, ELECTRIC, DOMESTIC-WATER HEATERS

A. Commercial, Electric, Storage, Domestic-Water Heaters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Smith, A. O. Corporation.
b. Lochinvar, LLC.
c. State Industries

2. Standard: UL 1453.
3. Storage-Tank Construction: ASME-code, steel vertical arrangement.

a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.

1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.

b. Pressure Rating: 150 psig.
c. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining material into tappings.

4. Factory-Installed Storage-Tank Appurtenances:

    a. Anode Rod: Replaceable magnesium.
    b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
    c. Insulation: Comply with ASHRAE/IESNA 90.1.
    d. Jacket: Steel with enameled finish.
    e. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.
    f. Temperature Control: Adjustable thermostat.
    g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
    h. Relief Valves: ASME rated and stamped for combination temperature-and-pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.

5. Special Requirements: NSF 5 construction.

B. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Smith, A. O. Corporation.
    b. Lochinvar, LLC.
    c. State Industries

2. Standard: UL 174.
3. Storage-Tank Construction: Steel, vertical arrangement.

    a. Tappings: ASME B1.20.1 pipe thread.
    b. Pressure Rating: 150 psig.
    c. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining material into tappings.

4. Factory-Installed Storage-Tank Appurtenances:

    a. Anode Rod: Replaceable magnesium.
    b. Dip Tube: Required unless cold-water inlet is near bottom of tank.
    c. Drain Valve: ASSE 1005.
    d. Insulation: Comply with ASHRAE/IESNA 90.1.
    e. Jacket: Steel with enameled finish.
    f. Heat-Trap Fittings: Inlet type in cold-water inlet and outlet type in hot-water outlet.
    g. Heating Elements: Two; electric, screw-in immersion type; wired for simultaneous operation unless otherwise indicated. Limited to 12 kW total.
    h. Temperature Control: Adjustable thermostat.
    i. Safety Control: High-temperature-limit cutoff device or system.
    j. Relief Valve: ASME rated and stamped for combination temperature-and-pressure relief valves. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valve with sensing element that extends into storage tank.

5. Special Requirements: NSF 5 construction with legs for off-floor installation.

2.2 DOMESTIC-WATER HEATER ACCESSORIES

A. Domestic-Water Compression Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. AMTROL, Inc.
    b. Flexcon Industries.
    c. Honeywell.
    d. Pentair Pump Group.
    e. Smith, A. O. Corporation.
    f. State Industries.
    g. TACO Comfort Solutions, Inc.

2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
3. Construction:

    a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
    b. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
    c. Air-Charging Valve: Factory installed.

4. Capacity and Characteristics:

    a. Working-Pressure Rating: 150 psig.
    b. Capacity Acceptable: 10 gal. minimum.

B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

1. Provide galvanized steel (24 gage min.) or other corrosion resistant material plastic or PVC accepted metal safety pan with a minimum depth of 1-1/2 inches and of sufficient size and shape to receive all drippings and/or condensate from the water storage tank or heater. The pan shall be drained by an indirect waste pipe no less than one (1) inch in diameter or the diameter of theutlet of the required relief valve(s) whichever is larger
2. The pan drain shall extend full-size and terminate over a suitably located indirect waste receptor or floor drain or extend to the exterior of the building and terminate no less than six (6) inches or more than twenty-four (24) inches above grade.
3. When the discharge from the relief valve(s) is to be discharged into the safety pan, it shall be piped full-size of the valve outlet pipe size to a point not more than two (2) inches or no less than one (1) inch above the pan flood level rim.
4. The discharge from the relief valve shall be piped full-size separately to the outside of the building or to another approved terminal as provided for safety pan drain terminals but in no case shall the discharge from a relief valve be trapped.

C. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1.

D. Heat-Trap Fittings: ASHRAE 90.2.

E. Manifold Kits: Domestic-water heater manufacturer's factory-fabricated inlet and outlet piping for field installation, for multiple domestic-water heater installation. Include ball-, butterfly-, or gate-type shutoff valves to isolate each domestic-water heater and **calibrated** balancing valves to provide balanced flow through each domestic-water heater.

1. Comply with requirements for ball-, butterfly-, or gate-type shutoff valves specified in Section 22 05 23.12 "Ball Valves for Plumbing Piping," Section 22 05 23.13 "Butterfly Valves for Plumbing Piping," and Section 22 05 23.15 "Gate Valves for Plumbing Piping."
2. Comply with requirements for balancing valves specified in Section 22 11 19 "Domestic Water Piping Specialties."

F. Pressure-Reducing Valves: ASSE 1003 for water. Set at 25-psig-maximum outlet pressure unless otherwise indicated.

G. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.

H. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.

I. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.

J. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.

K. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.

L. Domestic-Water Heater Mounting Brackets: Manufacturer's factory-fabricated steel bracket for wall mounting, capable of supporting domestic-water heater and water.

2.3 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.

B. Hydrostatically test commercial domestic-water heaters to minimum of one and one-half times pressure rating before shipment.

C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 01 40 00 "Quality Requirements" for retesting and reinspecting requirements and Section 01 73 00 "Execution" for requirements for correcting the Work.

D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.

1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
2. Maintain manufacturer's recommended clearances.
3. Arrange units so controls and devices that require servicing are accessible.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
7. Install anchor bolts to elevations required for proper attachment to supported equipment.
8. Anchor domestic-water heaters to substrate.

B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 22 05 23.12 "Ball Valves for Plumbing Piping," Section 22 05 23.13 "Butterfly Valves for Plumbing Piping," and Section 22 05 23.15 "Gate Valves for Plumbing Piping."

C. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

D. Install combination temperature-and-pressure relief valves in water piping for electric, domestic-water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

E. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 22 11 19 "Domestic Water Piping Specialties."

F. Install thermometers on outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 22 05 19 "Meters and Gages for Plumbing Piping."

G. Install thermometers on inlet and outlet piping of residential, electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 22 05 19 "Meters and Gages for Plumbing Piping."

H. Assemble and install inlet and outlet piping manifold kits for multiple electric, domestic-water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each electric, domestic-water heater. Include shutoff valve and thermometer in each domestic-water heater inlet and outlet, and throttling valve in each electric, domestic-water heater outlet. Comply with requirements for valves specified in Section 22 05 23.12 "Ball Valves for Plumbing Piping," Section 22 05 23.13 "Butterfly Valves for Plumbing Piping," and Section 22 05 23.15 "Gate Valves for Plumbing Piping," and comply with requirements for thermometers specified in Section 22 05 19 "Meters and Gages for Plumbing Piping."

I. Install pressure-reducing valve with integral bypass relief valve in electric, domestic-water booster-heater inlet piping and water hammer arrester in booster-heater outlet piping. Set pressure-reducing valve for outlet pressure of 25 psig. Comply with requirements for pressure-reducing valves and water hammer arresters specified in Section 22 11 19 "Domestic Water Piping Specialties."

J. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.

3.2 CONNECTIONS

A. Comply with requirements for piping specified in Section 22 11 16 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 01 40 00 "Quality Requirements" for retesting and reinspecting requirements and Section 01 73 00 "Execution" for requirements for correcting the Work.

C. Prepare test and inspection reports.

END OF SECTION 22 33 00

SECTION 22 42 13.13
COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Water closets.
2. Flushometer valves and tanks.
3. Toilet seats.
4. Supports.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 FLOOR-MOUNTED, BOTTOM-OUTLET WATER CLOSETS

A. Water Closets: Floor mounted, bottom outlet, top spud.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Standard.
b. Gerber Plumbing Fixtures LLC.
c. Kohler Co.
d. Mansfield Plumbing Products LLC.
e. Sloan Valve Company.
f. TOTO USA, INC.
g. Zurn Industries, LLC.

2. Bowl:

a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
b. Material: Vitreous china.
c. Type: Siphon jet.
d. Style: Flushometer valve.

3. Toilet Seat: IAPMO/ANSI Z124.5, Type A (residential), Shape 3 (elongated rim), open front, without cover, and shaped to match bowl.

2.2 FLUSHOMETER VALVES

A. Battery-Powered, Solenoid-Actuator, Piston Flushometer Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Standard.
    b. Gerber Plumbing Fixtures LLC.
    c. Hydrotek International, Inc.
    d. Kohler Co.
    e. Moen Incorporated.
    f. Sloan Valve Company.
    g. TOTO USA, INC.
    h. Zurn Industries, LLC.

2. Standard: ASSE 1037.
3. Minimum Pressure Rating: 125 psig.
4. Features: Include integral check stop and backflow-prevention device.
5. Material: Brass body with corrosion-resistant components.
6. Exposed Flushometer-Valve Finish: Chrome plated.
7. Panel Finish: Chrome plated or stainless steel.
8. Actuator: Solenoid complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
9. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 TOILET SEATS

A. Toilet Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Standard.
    b. Bemis Manufacturing Company.
    c. Centoco Manufacturing Corporation.
    d. Church Seats; Bemis Manufacturing Company.
    e. Kohler Co.
    f. Olsonite Seat Co.
    g. TOTO USA, INC.
    h. Zurn Industries, LLC.

2. Standard: IAPMO/ANSI Z124.5.
3. Material: Plastic.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Water-Closet Installation:

1. Install level and plumb according to roughing-in drawings.
2. Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.

B. Support Installation:

1. Install supports, affixed to building substrate, for floor-mounted, back-outlet water closets.
2. Use carrier supports with waste-fitting assembly and seal.
3. Install floor-mounted, back-outlet water closets attached to building floor substrate, onto waste-fitting seals; and attach to support.
4. Install wall-mounted, back-outlet water-closet supports with waste-fitting assembly and waste-fitting seals; and affix to building substrate.

C. Flushometer-Valve Installation:

1. Install flushometer-valve, water-supply fitting on each supply to each water closet.
2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
3. Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.
4. Install actuators in locations that are easy for people with disabilities to reach.
5. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

D. Install toilet seats on water closets.

E. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Section 22 05 18 "Escutcheons for Plumbing Piping."

F. Joint Sealing:

1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to water-closet color.
3. Comply with sealant requirements specified in Section 07 92 00 "Joint Sealants."

3.2 CONNECTIONS

A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.

B. Comply with water piping requirements specified in Section 22 11 16 "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Section 22 13 16 "Sanitary Waste and Vent Piping."

D. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.3 ADJUSTING

A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.

B. Adjust water pressure at flushometer valves to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.4 CLEANING AND PROTECTION

A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.

B. Install protective covering for installed water closets and fittings.

C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 13.13

SECTION 22 42 16.13
COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Lavatories.
2. Faucets.
3. Supply fittings.
4. Waste fittings.
5. Supports.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Plumbing Provisions", for related requirements. Refer to other sections of Division 22 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 WALL-MOUNTED LAVATORIES

A. Lavatory: Vitreous china, wall mounted, with back.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Standard.
b. Kohler Co.
c. Mansfield Plumbing Products LLC.
d. Peerless Pottery Sales, Inc.
e. Sloan Valve Company.
f. Zurn Industries, LLC.

2. Fixture:

a. Standard: ASME A112.19.2/CSA B45.1.
b. Type: For wall hanging.

B. Lavatory: Wheelchair, vitreous china, wall mounted.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Standard.
b. Kohler Co.
c. Mansfield Plumbing Products LLC.
d. Peerless Pottery Sales, Inc.
e. Sloan Valve Company.
f. Zurn Industries, LLC.

2. Fixture:

a. Standard: ASME A112.19.2/CSA B45.1.
b. Type: Slab or wheelchair.

3. Lavatory Mounting Height: Handicapped/elderly according to ICC A117.1.

2.2 SOLID-BRASS, MANUALLY OPERATED FAUCETS

A. NSF Standard: Comply with NSF 372 for faucet materials that will be in contact with potable water.

B. Lavatory Faucets: solid-brass valve.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Standard.
b. Bradley Corporation.
c. Chicago Faucets; Geberit Company.
d. Delta Faucet Company.
e. Elkay Manufacturing Co.
f. Gerber Plumbing Fixtures LLC.
g. GROHE America, Inc.
h. Kohler Co.
i. Moen Incorporated.
j. Speakman Company.
k. Zurn Industries, LLC.

2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.

2.3 SOLID-BRASS, AUTOMATICALLY OPERATED LAVATORY FAUCETS

A. NSF Standard: Comply with NSF 372 for faucet materials that will be in contact with potable water.

B. Lavatory Faucets: Automatic-type, battery-powered, electronic-sensor-operated, solid-brass valve.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Standard.
b. Bradley Corporation.
c. Kohler Co.

d. Moen Incorporated.
e. Sloan Valve Company.
f. Speakman Company.
g. TOTO USA, INC.
h. Zurn Industries, LLC.

2. Standards: ASME A112.18.1/CSA B125.1 and UL 1951.
3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.

2.4 LAMINAR-FLOW, FAUCET-SPOUT OUTLETS

A. NSF Standard: Comply with NSF 372 for faucet-spout-outlet materials that will be in contact with potable water.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AM Conservation Group, Inc.
2. Chronomite Laboratories, Inc.
3. NEOPERL, Inc.
4. T&S Brass and Bronze Works, Inc.

C. Description: Chrome-plated-brass, faucet-spout outlet that produces non-aerating, laminar stream. Include external or internal thread that mates with faucet outlet for attachment to faucets where indicated and flow-rate range that includes flow of faucet.

2.5 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF 372 for supply-fitting materials that will be in contact with potable water.

B. Standard: ASME A112.18.1/CSA B125.1.

C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.

D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.

E. Standard: ASME A112.18.2/CSA B125.2.

F. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.

2.6 SUPPORTS

A. Type II Lavatory Carrier:

1. Standard: ASME A112.6.1M.

B. Type III Lavatory Carrier:

1. Standard: ASME A112.6.1M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

B. Examine counters and walls for suitable conditions where lavatories will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install lavatories level and plumb according to roughing-in drawings.

B. Install supports, affixed to building substrate, for wall-mounted lavatories.

C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.

D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 22 05 18 "Escutcheons for Plumbing Piping."

E. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 07 92 00 "Joint Sealants."

F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 22 07 19 "Plumbing Piping Insulation."

3.3 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Comply with water piping requirements specified in Section 22 11 16 "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Section 22 13 16 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

A. After completing installation of lavatories, inspect and repair damaged finishes.

B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective covering for installed lavatories and fittings.

D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 16.13

SECTION 23 01 00
GENERAL MECHANICAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE OF DIVISION

A. Work shall include all materials, equipment and labor necessary for a complete and properly functioning mechanical installation in accordance with all applicable codes, and contract drawings and specifications. Work shall include all work specified in Division-23, HVAC.

B. Pay for all required licenses, fees, inspections and permits.

1.3 RELATION TO OTHER WORK

A. Work Not in Division 23: Related work not included in this division consists of requirements given in the following as may be included in the contract documents:

1. Other divisions which may include work (such as concrete, steel, painting, ceiling systems, structure and other work) related to the work of Division 23.

B. Work of Division 23: Any or all sections of Division 23 may include a paragraph or paragraphs under the heading, "Relation to other Work". Where such a paragraph is indicated and work directly related to the section is listed or described, such work shall be considered as relating directly to the indicated section. Any related work (directly related or otherwise) which may be omitted by reference from the "Relation to Other Work" paragraph of such section(s), shall be provided as necessary and required whether or not such work is included by reference. Such listing or description of related work within a section is given only as a convenience to the Contractor; omission of other related sections or described work does not in any way exclude the provision of such work.

C. The mechanical contractor shall coordinate with the controls vendor for all control related equipment that is provided by the controls vendor and installed by the mechanical contractor. Refer to specification 23 09 23 for list of controls vendor supplied items to be installed by the mechanical contractor.

1.4 CODES

A. Install all work in accordance with the latest edition of all applicable regulations and governing codes, including the regulations of the utility companies serving the project.

B. Where a conflict in code requirements occurs the more stringent requirement shall govern.

1.5 STANDARDS

A. All equipment and devices shall bear U.L. label, the label of an industry recognized approved testing agency or A.G.A. certification for said item of equipment or device.

B. All electrical devices must be U.L. approved.

1.6 DRAWINGS

A. Architectural and structural drawings take precedence over mechanical drawings with reference to the building construction. Mechanical drawings are diagrammatic and indicate the general arrangement and extent of work. Architectural drawings indicate more exactly the desired relationship between diffusers, registers, lighting fixtures, equipment, electric panels and devices, plumbing fixtures, and other items which remain exposed in the completed building. Exact locations and arrangement of materials and equipment shall be determined, with the acceptance of the Architect/Engineer, as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades. Where locations of equipment, devices or fixtures are controlled by architectural features, establish such locations by referring to dimensions on Architectural drawings and not by scaling drawings.

1.7 DISCREPANCIES

A. In case of differences between drawings and specifications, or where drawings and specifications are not clear or definitive, the more stringent requirement shall apply. Any such discrepancies shall be referred to Architect/Engineer for clarification and instructions.

1.8 ELECTRICAL PROVISIONS

A. Work of Division 23 shall include the electrical requirements which are indicated to be integral with mechanical work and which can be summarized to include (but not necessarily be limited to) the following:

1. Motors
2. Unless shown otherwise, motor starters are to be furnished by mechanical contractor, installed by electrical contractor.
3. In lieu of the mechanical contractor furnishing motor starters, the mechanical contractor can coordinate with the electrical contractor where the electrical contractor furnishes and installs a combination motor starter / disconnect switch.
4. Control switch, pilot lights, interlocks and similar devices.
5. Electrical heating coils and similar elements in mechanical equipment.
6. Electrical work specified in Division-23 for the HVAC control system.
7. Drip pans to protect electrical work.

B. Motors, Starters, Switches:

1. All motors 1HP and above associated with mechanical equipment that are not being provided with a variable frequency drive shall be provided with a motor starter.
2. For motors under 1HP that are required to be controlled shall be coordinated with the building automation system to ensure start / stop control is achieved. Provide all relays, wiring and devices as required to achieve desired control.

C. Drip Pans: Where possible, do not run mechanical piping directly above electrical (or electronic) equipment which is sensitive to moisture; otherwise provide drip pans under mechanical piping. Locate pan below piping and extend 6" on each side of piping and lengthwise 18" beyond equipment. Fabricate pans 2" deep, of reinforced sheet metal with rolled edges and soldered or welded seams; 20 gage copper, or 16 gage steel with 2 oz. zinc finish hot dipped after fabrication. Provide 3/4" copper drainage piping, properly discharged to a waste receptor.

D. Motors: Refer to “Electric Motors, Premium Efficiency Type”.

1.9 ELECTRICAL/MECHANICAL WORK

A. Definitions: Definitions for the purpose of mechanical/electrical control and power coordination are as follows: (Note: The use of the words, "Provide", "furnish" and "install" are intended only for use in describing the coordination indicated by this paragraph and do not necessarily have the same definitions when used outside of the context of this paragraph.) Any items which do not fall within the scope of this paragraph shall be coordinated as individually specified.

1. "Furnish" means to procure an item and to deliver it to the project for installation.
2. "Install" means to determine (in coordination with others as necessary) the appropriate intended location of an item and to set and connect it in place.
3. "Provide" means to both furnish and install.
4. Power Circuit: Circuit which carries main electric power to apparatus to which the power circuit is connected.
5. Control Circuit: Circuit which carries electrical signals directing the performance of a controller, but which does not carry the main electric power. (See NEC, Section 430-71.) Such circuits shall also include those which serve a dual control and power function (e.g., a line voltage thermostat circuit which both activates and powers a small fan motor).
6. Controller: A device, or group of devices, which serves to govern, in some predetermined manner, electric power delivered to apparatus to which the controller is connected and includes any switch or device normally used to start and stop a motor. (See NEC, Article 100, Definitions, "Controller", and Section 430-81(a).)
7. Control Device: A device which reacts to an operating condition (pressure, temperature, flow, humidity, etc.) and which initiates transmission of an electrical control signal which causes operation of a controller or which causes operation of pressure switches, etc.
8. Auxiliary Control Device: A device (such as a low voltage control transformer, electric relay, etc.) which is located in a control circuit and which carries or responds to (but does not initiate) an electrical control signal initiated by a control device.

B. Work of Division-23 includes (but is not necessarily limited to):

1. Provide:

a. All controllers which are generally manufactured or shipped as integral with Division-23 equipment (such as starters packaged with chillers, etc.).
b. All electric motors and other electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.) which are specified in Division 23.
c. All control circuits (including conduit and boxes) from the Division-26 panels to point of use including the necessary circuit breakers.
d. All other control circuits, including conduit and boxes.
e. All control connections to equipment.
f. All control connections to controllers, switches, motors and other mechanical systems electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
g. Auxiliary control devices.
h. All control devices (thermostats, pressure switches, flow switches, humidistats, etc.) and make control circuit connections thereto.
i. Any and all pneumatic and electronic and electric control devices and electric or pneumatic connections thereto.

2. Furnish:

    a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-23 equipment (such as centrifugal chiller starters which are matched with the chillers but are not physically an integral part of the chiller assembly.)

C. Work of Division-26 includes (but is not necessarily limited to):

1. Provide:

    a. All power circuits, including conduit and boxes.
    b. All power connections to controllers, switches, motors and other mechanical systems electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
    c. All remote motor disconnects (remote from the related controller) at all locations required by NEC and connections thereto except those disconnects which are specified in Division-23 to be provided as part of the equipment itself.
    d. If coordinated with the mechanical contractor, all combination starter / disconnect switches required for mechanical motors.
    e. All controllers (except those which are generally manufactured or shipped as separate but companion items to Division-23 equipment such as centrifugal chiller starters).

2. Install:

    a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-23 equipment (e.g., chiller starters).
    b. Motor starters or variable frequency drives furnished by the mechanical contractor for motors associated with mechanical equipment.

1.10 AUXILIARIES AND ACCESSORIES

A. Include all auxiliaries and accessories for complete and properly operating systems.

1.11 INVESTIGATION OF SITE

A. Check site and existing conditions thoroughly before bidding. Advise Architect/Engineer of discrepancies or questions noted before bidding.

1.12 ASBESTOS

A. Should asbestos, or any other hazardous waste material, be encountered during the execution of the work, or should the presence of asbestos or any other hazardous material be suspected, immediately notify the Owner and suspend all work in the affected area. The Owner will activate an assessment study to determine the presence of asbestos, or other hazardous material, and evaluate what condition it is in. Removal of asbestos, or other hazardous material, if required, will be conducted by a qualified Contractor, and will be done under separate contract.

1.13 COORDINATION

A. Provide all required coordination and supervision where work of this division connects to or is affected by work of others.

1.14 PROVISIONS FOR OPENINGS

A. Provide all openings required for work performed under Division-23. Provide sleeves or other approved methods to allow passage of items installed under any Section of Division-23.

1.15 INTERRUPTION OF EXISTING SERVICES

A. Any interruption of existing services shall be coordinated in advance with the Owner's Representative. Shutdown time and duration of critical services shall be decided by the Owner. Contractor shall provide shutoff valves at point of tie-in to minimize downtime.

1.16 CLEANING AND PROTECTION

A. Ductwork: Keep the interior of the duct system free from dirt and rubbish and other foreign matter. All fan motors, switches, and other items shall also be protected from dirt, rubbish and other foreign matter during building construction. Thoroughly clean all components of the ductwork and remove all dirt, scale, oil and other foreign substances which may have accumulated during the installation process.

B. Equipment: All mechanical equipment provided shall be thoroughly cleaned of all dirt, oil, concrete, etc. Any dents, scratches or other visible blemishes shall be corrected, and the appearance of the equipment made "like new" and to the satisfaction of the Architect/Engineer.

C. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.

D. Protection of Work Until Final Acceptance: Protect all materials and equipment from damage, entrance of dirt and construction debris from the time of installation until final acceptance. Any materials and equipment which are damaged shall be repaired to "as new" condition or replaced at the direction of the Architect/Engineer. Where factory finishes occur and damage is minor, finishes may be touched up. If, in the opinion of the Architect/Engineer the damage is excessive, factory finish shall be replaced to "new" condition.

1.17 SHOP DRAWINGS

A. Submit shop drawings for all items, services and systems included in the project.

B. Shop drawings shall clearly show the following:

1. Technical and descriptive data in detail equal to or greater than the data given in the item specification. Indicate all characteristics, special modifications and features. Where performance and characteristic data is shown on the drawings or specified, submitted data shall be provided in a degree which is both quantitatively and qualitatively equal to that specified and shown so that comparison can be made. Present data in detail equal to or greater than that given in item specification and include all weights, deflections, speeds, velocities, pressure drops, operating temperatures, operating curves, temperature ranges, sound ratings, dimensions, sizes, manufacturers' names, model numbers, types of material used, operating pressures, full load amperages, starting amperages, fouling factors, capacities, set points, chemical compositions, certifications and endorsements, operating voltages, thicknesses, gauges and all other related information as applicable to particular item.
2. Exceptions to or deviations from the contract documents. Should Architect/Engineer accept any items having such deviations which are not clearly brought to

Architect/Engineer's attention, in writing, on item submittal, then Contractor is responsible for correction of such deviations regardless of when such deviations are discovered.

C. Additional Requirements: See specific sections of the Specifications for any additional requirements.

1.18 SHOP DRAWINGS TECHNICAL INFORMATION SUBMITTALS

A. All submittals are to be submitted electronically in the form of PDF. Electronic submittal file names must be formatted with the specification section number followed by the title of the specification section. One PDF file shall be provided for each specification section that requires submittals to be provided.

B. A cover page shall have adequate space for Contractor, Subcontractor and Engineer review stamps and indicate the following minimum data:

1. Project Name
2. Project Address
3. Contractor Name
4. Subcontractor Name
5. Specification Section Number
6. Specification Section Name
7. Submittal Date

C. All shop drawings and equipment submittals shall be submitted complete based on specification division. Partial submittals of each specification section will not be accepted.

D. All submittals shall have been reviewed for compliance by the Contractor and associated subcontractor prior to submission to the Engineer. A stamp bearing the name of the reviewer and date review was completed shall be on the cover page of the submittal.

E. Submittal data shall be logically grouped based on equipment tags or like material. For submittals that contain data on multiple materials or equipment, it shall be clearly noted by equipment tag or applicable material.

F. Manufacturer’s data indicating multiple options or choices shall be clearly noted as to what is applicable to the material and equipment being provided. Information not applicable should be struck through or extracted.

1.19 SHOP DRAWINGS FOR PIPING SYSTEMS AND DUCT SYSTEMS

A. Shop drawings for piping systems and duct systems shall be performed by the installing subcontractors. Shop drawings shall show all required maintenance and operational clearances required. Title drawings shall include identification of project and names of Architect, Engineer, Contractor, subcontractor and/or supplier, date, be numbered sequentially and shall indicate the following:

1. Architectural and structural backgrounds with room names and numbers, etc., including but not limited to plans, sections, elevations, details, etc.

a. Fabrication and Erection dimensions.
b. Arrangements and sectional views.
c. Necessary details, including complete information for making connections with other work.
d. Kinds of materials and finishes.

e. Descriptive names of equipment.
f. Modifications and options to standard equipment required by the contract.

B. Also provide shop drawings, using architectural reflected ceiling plans, which indicate locations of the following (to be verified by Contractor): Air distribution devices, sprinkler heads, lights, access panels, fire alarm, speakers, projectors or any system device intended to be installed in the ceiling.

C. Shop drawings shall be submitted in electronic PDF format and shall bear the review stamp from the mechanical subcontractor and general contractor / CM that it has been reviewed for compliance.

D. See specific sections of specifications for further requirements.

1.20 AIR HANDLING UNIT AND DUCTWORK CONFIGURATION SHOP DRAWINGS

A. Contractor shall submit a shop drawing for all system and shall meet the following requirements:

1. Be drawn at not less than a scale of 1/4" = 1'-0". Contractor may elect to use a larger scale if he desires (i.e., if drawing of unit is at 1/4" = 1'-0", 1/2" = 1'-0" may be used.).
2. Clearly show all proposed ductwork configuration changes (sizes, routing, and similar differences) which are different in any respect from the Drawings.
3. Where proposed changes affect any other work such as structure, housekeeping pads, piping, equipment, electrical work or any other work, shop drawings shall clearly show those proposed changes.
4. Where Drawings show units in plan only, shop drawings shall show proposed units in plan and also in elevation.
5. Shop drawings shall also show exact locations of related work (such as bar joists, columns, beams, sound attenuators, and like items) which affect the proposed ductwork routing and unit location and configuration.
6. Each section of each air handling unit shall be clearly identified (i.e., coil section, fan section, filter section, mixing box section, etc.).

B. Failure to submit these shop drawings together at the same time with the air handling unit shop drawings will result in total disapproval of the proposed air handling units. Time delays or other reasons will not be considered.

C. Shop drawings shall be submitted in electronic PDF format and shall bear the review stamp from the mechanical subcontractor and Contractor that it has been reviewed for compliance.

1.21 ELECTRONIC FILES

A. CADD files will be available on a limited basis to qualified firms at the Architect's / Engineer's prerogative. Recipients are cautioned that these files may not accurately show actual conditions as constructed. Users are responsible to verify actual field conditions. These files are not intended to be used as shop drawings.

B. Any requests for electronic files shall be preceded by processing the required electronic file release form and submitting to the Engineer for authorization. Request for electronic files should be submitted through the Contractor for submission to the Architect / Engineer.

1.22 OPERATING INSTRUCTIONS

A. Submit for checking a specific set of written operating instructions on each item which requires instructions to operate. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe operating instructions.

1.23 MAINTENANCE INFORMATION

A. Submit for acceptance Maintenance Information consisting of manufacturer's printed instruction and parts lists for each major item of equipment. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe maintenance.

1.24 MANUFACTURER'S CHECK-OUT

A. Check out by Manufacturer's Representative (for major items of equipment): At completion of construction and after performance verification information as above-mentioned has been gathered, submitted and accepted, provide one copy of this information to the manufacturer's representative. Work required under this section shall include having the representative examine the performance verification information, check the equipment in the field while it is operating, and sign a Check-Out Memo for record. Submit a copy of the memo on each major item of equipment for each brochure. Accepted memos shall be inserted on each brochure with the performance verification information and submittal data. Memos shall be submitted and accepted before Instruction in Operation to Owner or a request for final inspection.

1.25 SYSTEM GUARANTEE

A. The work required under Division-23 shall include a one-year guarantee. This guarantee shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System. This guarantee shall also include reasonable adjustments of the system required for proper operation during the guarantee period. Explain the provisions of guarantee to Owner at the "Instruction in Operation Conference".

1.26 INSTRUCTION TO OWNER

A. Submit all required items for checking one week before final inspection of the building is scheduled. When all items are accepted and placed in the proper brochures, the Contractor shall give notice in writing that he is ready to give the Owner an "Instruction in Operation Conference". After the above mentioned request is received the Contractor will be notified of the time the conference can be held with the Owner. At the conference, the Contractor shall review with the Owner all appropriate information. At the end of the conference, seven copies of a memo certifying Instruction in Operation and Completed Demonstration shall be signed by the Contractor, Subcontractor and Owner and one copy inserted in each brochure.

1.27 MATERIALS AND EQUIPMENT

A. Each bidder represents that his bid is based upon the materials and equipment described in this division of the specifications.

1. Submittal shall include the name of the material or equipment for which it is to be substituted, substituted equipment model numbers, drawings, cuts, performance and test

data and any other data or information necessary for the Architect/Engineer to determine that the equipment meets all specification and requirements. If the Architect/Engineer accepts any proposed substitutions, such acceptance will be set forth in writing.

2. Substituted equipment with all accessories installed or optional equipment where permitted and accepted, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether accepted or not, shall be replaced at the Contractor's expense. Any modifications of related systems of this or other trades as a result of substitutions shall be made at the Contractor's expense, and Contractor shall so state in his written request for substitution.

B. Acceptable Manufacturers: Materials and Equipment specified in these contract documents are accepted only in regard to general performance and quality. It shall be the Contractor's responsibility to ensure that acceptable materials and equipment meet or exceed the efficiencies, capacities, electrical characteristics, performance and quality of the equipment herein specified. Acceptable equipment must also generally conform, without extensive modification of related systems to the accessories, weights, space and maintenance requirements, etc., of the specified equipment. Any modification to related systems of this or other trades shall be made at the Contractor's expense and the Contractor shall be responsible for coordination between trades. Any difference in capacity, efficiency, electrical characteristics, weights or quality of product, etc., between specified materials and equipment and acceptable alternates shall be submitted to the Architect/Engineer for acceptance within 30 days of Notice to Proceed.

C. If no prior approval for substitutions or alternate manufacturers have been provided, the bid must conform with the requirements of the plans and specifications. No equipment substitutions or alternate manufacturers will be considered once the project bidding has ended.

PART 2 - PRODUCTS

2.1 Section part not applicable.

PART 3 - EXECUTION

3.1 Section part not applicable.

END OF SECTION 23 01 00

SECTION 23 05 00
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section, in addition to the following:

1.2 SCOPE

A. Materials listed herein are general mechanical materials to be used under the Division 23 sections of the specifications unless specifically noted otherwise in the particular section or on the drawings.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications. This section relates to all sections of Division 23 as may be applicable to the work of each section.

1.4 STANDARDS

A. Quality and weight of materials shall comply with requirements and specifications of the appropriate standards of the American Society of Testing and Materials.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT, GENERAL

A. All materials and equipment shall be new and without blemish or defect.

B. Equipment and materials shall be products which will meet with the acceptance of the agency inspecting the work. Where acceptance is contingent upon having the products examined, tested and certified by Underwriters Laboratory or other recognized testing laboratory, the product shall be so examined, tested and certified.

C. Where no specific indication as to the type or quality of material or equipment is indicated, a standard item or system shall be furnished with all options, features and capabilities to meet the project requirements.

D. Performance and Capacity:

1. Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance. In some cases equipment may be sized to allow for future requirements or for other reasons which may not be stated on the Drawings or in the Specifications; provide equipment and systems with the capacities, capabilities and features indicated to provide the maximum or minimum (as appropriate) conditions.

E. Operating conditions and capacities must be as follows:

1. No overloading.

2. No operation at conditions outside of maximum and minimum limits recommended by the manufacturer and accepted by the Architect/Engineer.
3. Compatible with all systems.

F. Unless otherwise specified, all equipment and materials furnished must be as follows:

1. Recommended by the manufacturer for the application.
2. Installed in accordance with the manufacturer's recommendations for the application except where specifications and drawings clearly indicate otherwise.

2.2 ACCESS DOORS AND PANELS

A. Locations: Provide access doors and panels (access units) as necessary for access to items which are concealed and which may require service or maintenance or other reason for accessibility. Examples of such items include, but are not limited to, the following: valves, cleanouts, pipe unions, expansion joints and connectors, dampers, coils, junction boxes, duct heaters, terminal units, HVAC control system devices and similar types of items.

B. Access units: Shall be manufactured by the Milcor Division of Inland-Ryerson, Boico, Nystrom or Ventfabrics. Types are as follows (Milcor style designations are used for example only):

Location	Door/Panel Type
Drywall	Style "DW"
Masonry or tile	Style "M-stainless"
Acoustical tile	Style "AT"
Plaster	Style "K"
Fire-rated walls (**or as indicated below)	Style "Fire Rated"**

C. Fire Rated Units:

1. Frame and panel assembly shall bear a U.L. label reading, "frame and door assembly, rating 1-1/2-hour (B), temperature rise 30 minutes 250°F maximum".
2. Have an automatic closing device and mechanism to release the latch bolt from the inside.
3. Acceptable Manufacturers: Boico Style F, Inryco/Milcor Style VA, Nystrom Style APFR.

D. Non-fire Rated Units:

1. Steel panels and frames.
2. Locks and latches shall be as appropriate for the location and shall be cam-lock type latches, flush screw driver operated locks or cylindrical locks.
3. Provide two keys for all doors. All doors shall be keyed the same.

E. Other Requirements:

1. Doors and panels installed in glazed or ceramic tiled surfaces, in toilet rooms or in kitchens shall be stainless steel.
2. Unless otherwise indicated, finish shall be rust inhibitive prime coat.

F. Sizes:

1. Minimum size: 8" x 8".

2. Sizes of each unit shall be individually selected to allow the recommended and required service and maintenance and accessibility functions to be accomplished. These functions shall generally include, for example, valve removal, damper linkage resetting, control adjustment, lubrication, repair, replacement and similar tasks as may be necessary and recommended for the concealed item.
3. Sizes shall be of the following increments (unless otherwise approved) to allow the accessibility function to be accomplished: 8" x 8", 8" x 12", 12" x 12", 12" x 16", 16" x 16", 16" x 24", 24" x 24", 24" x 36", 30" x 30", 36" x 36" or 36" x 48".
4. No size smaller than 16" x 24" shall be allowed when a person must pass through the access opening in order to accomplish the desired accessibility function.
5. Every attic or furred space in which mechanical equipment is installed shall be accessible by an opening and passageway as large as the largest piece of the equipment and in no case less than 22 x 36 inches continuous from the opening to the equipment and its controls. The opening to the passageway shall be located not more than 20 feet from the equipment measured along the center line of such passageway.

2.3 PAINTING AND MARKING

A. All paint and materials used for painting shall be manufacturer's "first quality" product. For additional paint material requirements, refer to Section 09 91 01, Painting.

B. Marking: Refer also to sections describing identification of mechanical systems.

2.4 PIPE HANGERS AND SUPPORTING DEVICES

A. General: Refer to other sections of Division 23 for any requirements which may be additional to this section. Comply with the more stringent requirement if more than one method is specified or shown.

B. Pipe supporting devices specified herein shall apply to all Division 23 piping unless modified in subsequent sections of Division 23 (i.e., vibration isolation) or detailed on the drawings.

1. Pipe hangers for copper pipe shall be copper or copperplated and for steel pipe shall be zinc-plated, clevis type hangers.
2. Hangers for pressure piping shall be clevis type or accepted as equivalent. Pipe hangers shall be capable of vertical adjustment after erection of the piping. Piping shall not be hung from fire and/or smoke walls.
3. Vertical piping supports shall be constructed of carbon steel with rounded ears and two or four holes for clamping bolts. Steel, galvanized and cast iron piping riser clamps shall have galvanized finish. Copper and brass piping riser clamps shall have electro-plated copper or PVC coating finish.
4. Acceptable Manufacturers are Grinnell, PHD Manufacturing Inc., Fee and Mason, Michigan and Elcen.

C. Beam clamps may be used when supporting piping from steel structures.

D. Concrete inserts shall be placed in forms as work of Division 23 prior to the time that concrete is poured.

E. Lead tamp-ins may be used when installed in a concrete or masonry wall or other like vertical surface to support a vertical hanger. Lead tamp-ins will not be permitted to support hangers to the underside of a concrete slab.

F. For parallel runs of above ground suspended piping, an acceptable trapeze-type hanger may be used. Provide permanent, non-conductive type wrapping between copper pipe and steel trapeze hangers.

G. Powder set type fasteners or inserts shall not be used.

2.5 FLOOR, WALL OR CEILING PLATES OR ESCUTCHEONS IN EXPOSED AREAS

A. Shall be chrome-plated. Escutcheons for extended sleeves shall be of the type designed for that purpose. Split ring escutcheons will not be allowed.

B. Escutcheons to be as manufactured by Guarantee Specialty Mfg. Co., Cleveland, Ohio; American Sanitary Mfg. Co., Abingdon, Ill., or Beaton Cadwell.

C. Provide escutcheons or fabricated plates or collars at each location where pipe or duct passes through a finished surface. Escutcheons for flush sleeves shall be equivalent to Benton & Caldwell No. 3A chromium plated brass; for sleeves extending above floor shall be equivalent to Benton & Caldwell No. 36 chrome plated brass. Collars or plates for ducts and large diameter insulated pipe shall be fabricated of 18 gage galvanized copper bearing sheet steel, secured to structure and neatly fitted around duct or pipe.

2.6 SLEEVES

A. General: Lay out work and set sleeves in new or existing construction so that minimum cutting, drilling and patching is required. Seal all sleeves not used during construction period with grout. Seal unused penetrations and sleeves through fire rated barriers to prevent passage of smoke and heat using an Underwriters' Laboratories approved method; sealing method must be rated at least equivalent to the barrier being penetrated. Submit proposed method to show proof of UL approval.

B. Pipe Sleeves, Special Considerations: The following conditions require pipe sleeves as indicated:

1. Where subject to hydrostatic pressure: Sleeves installed in walls and floors subject to hydrostatic (water) pressures shall be "Link Seal" (Thunderline Corp) Type WS or accepted as equivalent.
2. Where piping is existing: When fire rated walls are to be erected where there is existing piping, provide Proset fire rated split wall system pipe sleeves, or accepted equivalent.
3. Where penetration is part of air duct or plenum system: Do not use plastic pipe for sleeves where floor being penetrated is part of an air plenum so that no fire or smoke hazard is introduced by use of plastic.
4. Where penetration is through fire rated barriers: Provide mild steel sleeves for penetrations of fire rated barriers.

C. Pipe Sleeves in Walls and Partitions:

1. Sleeves Above Grade: Use schedule 40 mild steel pipe or schedule 80 CPVC pipe. Provide sleeves built into wall, partition or beam of size to allow penetration by carrier pipe and insulation covering with not less than 1/4 inch minimum clear space between outer surface of carrier pipe covering (or carrier pipe surface if no covering is provided) and inner surface of sleeve.
2. Sleeves Below Grade in Exterior Walls: Schedule 40 steel hot dipped galvanized after fabrication or cast iron sleeve with not less than 1/4-inch x 3-inch center flange (water stop) around the exterior face of the wall.

3. Penetrations of fire rated barriers shall have only mild steel sleeves; plastic is not allowed.

D. Pipe Sleeves in Floors Above Grade: Use schedule 40 mild steel pipe or schedule 80 CPVC pipe. Provide sleeves built into wall, partition or beam of size to allow penetration by carrier pipe and insulation covering with not less than 1/4 inch minimum clear space between outer surface of carrier pipe covering (or carrier pipe surface if no covering is provided) and inner surface of sleeve. Set sleeves before floor is poured; extend not less than ½-inch above finished floor.

E. Pipe Sleeves in Floors on Grade: Sleeves shall be Schedule 40 steel or Schedule 80 CPVC plastic. Set sleeves before floor is poured. Size sleeves to allow penetration by carrier pipe and insulation covering with not less than 1/4 inch minimum clear space between outer surface of carrier pipe covering (or carrier pipe surface if no covering is provided) and inner surface of sleeve. Extend sleeve not less than ½ inch above finished floor.

F. Duct Sleeves: Sleeves or openings sized to pass mechanical ducts and covering shall be of framed steel construction in roof, wall, and partitions.

G. Sealing of Sleeves:

1. Pipe Sleeves Below Grade and On Grade: Caulk annular space between pipe and sleeve using approved caulking material to a minimum one inch deep. Result shall be a water tight and vermin proof penetration.
2. Pipe and Duct Sleeves Above Grade: Openings around pipes, ducts and other conduit passing through sleeves shall be made draft free and vermin-proof by solidly packing with mineral wool or fiberglass or by other such approved method.
3. Pipe and Duct Sleeves Through Fire Rated Barriers: All penetrations through fire rated barriers (both walls and floors) shall comply with Division-07 or be as specified in this Division.

2.7 FIRE AND/OR SMOKE RATED FLOOR, PARTITION OR WALL PENETRATION SEALANT

A. Seal shall be composed of fire barrier product, putty, or caulking materials used either in combination or singularly. Acceptable Manufacturers are 3M Corporation or Dow Corning.

B. All sealing of floor, partition or wall systems shall be in accordance of the requirements of the associated tested assembly (i.e. UL, USG). Coordinate assembly requirements with architectural drawings and specifications.

2.8 EXCAVATION AND BACKFILL

A. Provide as necessary to accomplish work specified. Perform in accordance with applicable State and Local codes and accepted good practice and in accordance with other applicable sections or divisions.

2.9 BELT DRIVES

A. General: Equip each motor driven machine not direct connected with V-belt drive. Belts shall be of correct cross section to fit properly in sheave grooves and shall be carefully matched for each drive. Sheaves shall be cast iron or steel, bored to fit properly on shafts and secured with keys of proper size. The rating of each drive shall be as recommended by manufacturer for service but shall be at least 1.5 times nameplate rating of motor.

B. Speed Adjustment: Adjust fan speed by change(s) in sheave size as necessary to obtain proper design air flow with fan in its installed location. Fans may be first fitted with variable pitch drives until proper speed adjustment is made and then fitted with proper fixed pitch drive size, or alternate sizes of fixed pitch drives may be used until proper fan needed to deliver necessary air quantity.

C. Vibration of Air Handling Equipment and Fan Units: For air handling equipment and fans driven by motors 5-hp or greater, field vibration levels will not be acceptable if the maximum vibration velocity or displacement measurement exceeds the following values (when measurements are taken at the bearing supports using a vibration analyzer with the filter set at the operating fan speed):

Fan Speed (RPM)	Maximum Vibration Level
800 or Less	5 Mils (0.127 mm) max. displacement
801 and Greater	0.20 in/sec. (5 mm/s) max. velocity

D. Belt and Coupling Guards: Each belt drive shall be equipped with an OSHA approved guard. Guards shall be constructed of #12 U.S. standard gage 3/4-inch diamond mesh wire screen, or equivalent, welded to one inch steel angle frames, and shall enclose all belts and sheaves. Tops and bottoms of guards shall be of substantial sheet metal or not less than #18 U.S. standard gage. Braces or supports must not "bridge" sound and vibration isolators. Guards shall be designed with adequate provision for movement of motor required to adjust belt tension. Means shall also be provided to permit oiling, use of speed counters, and other maintenance and testing operations with guard in place. All direct drive equipment shall have coupling guards in accordance with Florida Department of Business Regulation safety regulations and OSHA.

2.10 BEARINGS

A. All bearings shall be 200,000-hour rated unless otherwise specified.

PART 3 - EXECUTION

3.1 EQUIPMENT ACCESS

A. Access Doors and Panels:

1. Locations: Provide access unit at the following locations.

   a. Where additionally specified in other sections of this Divisions 22 and 23 and where specifically indicated on the drawings.
   b. Where not specifically indicated on the drawings but where the work to be provided will require accessibility for purposes as described or as recommended by the manufacturer of the concealed item.
   c. At all locations where concealed equipment, fixtures, devices and similar items require accessibility for service, inspection, maintenance, repair, replacement and where such concealed item would not otherwise be accessible for such functions without the provision of an appropriately sized access unit.

B. Installation:

1. Definitions: For the purpose of coordination of responsibility, the following words are defined to describe the intended coordination.

a. "Furnish" means to procure an item and deliver it to the project for installation.
b. "Install" means to determine (in coordination with others as necessary) the intended appropriate location of an item and to set, connect and otherwise fix in place in a manner to allow intended operation and use.
c. "Provide" means to both furnish and install fully and completely in all aspects.

2. Furnishing Access Units: Access units shall be furnished as work of the Division which governs the item which is intended to be made accessible by the access unit.
3. Installing Access Units: Access units shall be installed as work of the Division which governs the surface, barrier, partition or other building component in and on which the access unit is to be placed.
4. Determination of Locations:

   a. Where the work of Division 23 requires that the access unit be provided (i.e., both furnished and installed), then the responsibility for determination of the location at which the access unit is to be placed is also work of Divisions 23.

5. Determination of Sizes:

   a. Unless an access unit size is indicated on the drawings or otherwise specified, the size of each access unit shall be determined as work of the Division which either provides or furnishes the access unit.
   b. Sizes for access units which are provided or furnished as work of this Division shall be in compliance with sizing criteria of this Division.

3.2 PAINTING

A. Paint all exposed piping, insulation, equipment, structural bases, racks, in equipment rooms and on roof, furnished under Division 23 of these specifications. All exposed metal surfaces shall be given one prime coat and two finish coats. All insulated surfaces shall be given one sizing coat of glue sizing (omit this step if factory applied finish is suitable to receive prime coat), one prime coat and one finish coat. Factory painted or finished items do not require field painting but shall require "touch-up" with matching paint or finish where scratched.

B. Pipe hangers, saddles, supports, riser clamps and accessories shall be painted to match their piping.

C. Equipment not completely accessible for painting when set in place shall be thoroughly cleaned and painted before installation and suitably protected.

D. Piping concealed or provided with aluminum or PVC jacketing need not be painted.

3.3 HANGERS AND INSERTS

A. Refer also to other sections which may describe additional requirements for hanging and supporting. Comply with the more stringent requirement if more than one method is specified or shown.

B. Provide and properly locate hangers to adequately support piping and equipment. Arrange hangers to permit expansion and contraction.

C. The size of hanger for non-insulated pipes shall be suitable for pipe size to be supported. For insulated piping, the size of the hanger shall be suitable for the pipe size, plus the insulation and a 16-gauge half-circle galvanized sheet metal insulation saddle.

D. Isolation of copper pipe from steel hangers to consist of wrapping pipe at, and 1" each side of contact surface with not less than two layers of adhesive type plastic electrical insulating tape.

E. Pipe supports for piping 2" diameter and below may be supported directly from Epicure steel decking using Epicure standard hangers (200 lb. max. load). Piping above 2" shall be supported from steel beams.

F. Locate pipe supports as follows unless noted in other sections of these specifications or on the drawings:

1. Horizontal cast iron pipe inside building - supported on each length of pipe.
2. Vertical cast iron pipe inside building - supported at each floor level and at the base.
3. Horizontal steel piping and copper tubing 1" diameter and under - support on 6' centers.
4. Horizontal steel piping and copper tubing above 1" through 1-1/2" diameter - support on 8' centers.
5. Horizontal steel piping and copper tubing larger than 1-1/2" diameter -support on 10' centers, except 24" diameter piping shall be supported by main roof beams (20' O.C. maximum).
6. Support vertical cast iron, steel and copper piping at each floor penetration not to exceed 20 foot intervals.

3.4 ANCHORS

A. Install a suitable anchor on piping to prevent movement from expansion and contraction by welding or clamping securely to pipe at fitting or coupling. Approval of the Architect/Engineer of method of anchorage must be obtained before installation of work. Properly anchor piping to remove strains on equipment which would be caused by expansion and contraction. Adequately insulate anchors on piping, with operating fluid temperatures below 75°F, to prevent moisture condensation problems.

3.5 EXPANSION AND CONTRACTION PROVISIONS

A. Piping is designed with offsets and loops to provide for expansion and contraction. At such points, piping shall be cold sprung to equalize expansion when at operating temperatures. Install piping to maintain grade at all operating temperatures.

3.6 FLASHING

A. Flashing shall be done as work of other divisions.

3.7 SLEEVES FOR PIPING

A. Provide sleeves for all piping where pipe penetrations in walls, floors or other building structure are required. Sleeves in poured concrete shall have watertight seams and joints.

B. Extend sleeves through walls, partitions and ceilings to finished surface. Extend sleeves through finished floors to not less than 1/4 inch above finished surface. Extend sleeves in concrete floors in chases to not less than 1 inch above floor top surface. Sleeves installed above finished ceilings as part of fire/smoke rated wall assemblies shall extend not less than 1" beyond both wall faces.

C. Provide sleeves of adequate size to permit clearance for pipe movement and proper grading and sloping of pipes. Provide sleeves for insulated pipe of adequate size to clear insulation.

D. Caulk space between sleeve's inner surface and pipe's outer surface (including insulation surface if pipe is insulated) with approved with fire rated safing material. Provide flexible fire-retardant sealant if pipe is subject to expansion or contraction. Final result shall be an approved fire and smoke stop at pipe and sleeve assembly.

E. Sleeves in walls and slabs subject to hydrostatic pressures shall be water tight at twice the hydrostatic pressure expected to be encountered at the location of the penetration.

3.8 SLEEVES FOR DUCTWORK

A. Ductwork sleeves shall be provided in accord with current SMACNA recommendations or as otherwise detailed on Drawings. Refer also section describing duct systems.

3.9 ESCUTCHEONS

A. Provide chrome plated brass escutcheons (for 1/4 or 1 inch projecting sleeves as required) at each point where an uninsulated pipe passes thru a finished surface.

3.10 CONCRETE BASES AND STRUCTURAL STEEL

A. Concrete bases and structural steel to support equipment and piping installed under each specification section or Division 23 and not specifically shown on the structural or architectural plans shall be included and provided for this work.

3.11 SEALANT

A. Fire/smoke sealant shall be installed in strict compliance with the manufacturer's installation instructions.

END OF SECTION 23 05 00

SECTION 23 05 13
ELECTRIC MOTORS, PREMIUM EFFICIENCY TYPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

B. Division 26 – Electrical.

1.2 SCOPE

A. This Section describes electric motors which are higher efficiency. These motors require less energy than standard electric motors which do not meet this specification.

B. This specification covers 3/4 HP or larger horizontal, 3 phase, integral horsepower, drip proof, squirrel cage induction motors in the NEMA frame sizes through 449.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the Drawings and Specifications.

1.4 STANDARDS

A. All motors shall be in accordance with the latest version of NEMA Standard MG-1. Motors shall also comply with the applicable portions of the National Electric Code.

1.5 SUBMITTALS

A. Independent motor submittals for motors that are part of air handling unit or pumping equipment shall be provided for all motors 1 HP or greater.

PART 2 - PRODUCTS

2.1 VOLTAGE FREQUENCY

A. Motors through 100 hp shall be rated 230/460 volts with 200 or 575 volts as optional; motors above 100 hp shall be rated 460 volts with 575 volts as optional. Motors will be rated for operation on a 3 phase, 60 Hertz power supply. Refer to Electrical Drawings.

2.2 COORDINATION

A. Where variable frequency drives are used to vary the speed and power consumption of electric motors, such motors must be high efficiency type and must be considered with the actual variable frequency drives which are provided so that optimum matching of variable frequency drive to driven motor is obtained.

2.3 OPERATING CHARACTERISTICS

A. Torques: Motors shall meet or exceed the locked rotor (starting) and minimum breakdown torques specified in NEMA standards for Design B for the ratings specified.

B. Currents: Locked rotor (starting) currents shall not exceed NEMA Design B maximum values for the specified rating. Motors shall be capable of a 20 second stall at six times full load current without injurious heating to the motor components.

C. Efficiency: Motors shall have full load efficiency which will meet or exceed the values for NEMA Premium® efficiency motors as listed in NEMA 1-2006, Table 12-12 when tested in accordance with NEMA test standard MG1-12.53a, IEEE Test Procedure 112, Method B, using accuracy improvement by segregated loss determination including stray load loss measurements. The minimum efficiency shall be guaranteed.

2.4 SERVICE FACTOR AND AMBIENT

A. Motors shall be rated for a 1.15 service factor in a 40°C ambient.

2.5 INSULATION

A. For constant speed application motors, provide full Class B insulation system.

B. For motors with variable frequency drive, provide with Class F insulation suitable for operation down to 10%.

2.6 FRAME SIZE

A. Horsepower/frame relationship shall conform to the latest NEMA Standard for T frame motors.

2.7 ENCLOSURE

A. Motors shall be drip proof construction.

B. Motor frame and endshields shall be of cast aluminum construction using alloys with low copper content.

2.8 BEARINGS

A. All motors shall have anti-friction bearings, sized for a L-10 life of at least 125,000 hours L-10 life for a direct connected load.

B. Aluminum endshields shall have a cast-in steel or cast iron bearing insert.

C. Bearing housing shall be regreasable with provisions for purging old grease.

D. Bearings shall be preloaded with a bearing loading spring to minimize noise and increase bearing life.

2.9 OTHER REQUIREMENTS

A. Conduit Box shall be diagonally split and rotatable in 90 degree increments.

B. External hardware shall be plated to resist corrosion.

C. External paint shall withstand industrial environments.

D. Nameplates shall be of stainless steel or aluminum and stamped per NEMA Standard MG1-10.37. Nameplate information shall include the nominal efficiency value per Standard MG1-12.53b and the manufacturer's minimum guaranteed efficiency value.

2.10 SHOP DRAWINGS

A. In addition to shop drawing requirements of the section entitled, "General Mechanical Provisions", provide motor data including horsepower; rpm; frame size; nominal efficiency and nominal power factor at full load, 75% load and 50% load; guaranteed efficiency and guaranteed power factor at full load, 75% load and 50% load.

PART 3 - EXECUTION

3.1 MOTOR LOCATIONS

A. Provide NEMA Premium® efficiency motors for the following as provided on this project:

1. All motors of 3/4 HP and above for all Division 23 motors.

END OF SECTION 23 05 13

SECTION 23 05 15
INSTRUCTIONS AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide complete written and verbal operating and maintenance instruction to the Owner for all mechanical systems.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Divisions 22 and 23 and to all other applicable portions of the Drawings and Specifications.

B. This section directly relates in particular to sections which describe the following:

1. Valves and piping systems components requiring maintenance and which are involved in the dynamic function of the systems.
2. Pumps and related flow devices.
3. Plumbing equipment (heat exchangers, packaged systems, etc.)
4. HVAC equipment (all air handling equipment, terminal units, filter assemblies, etc).
5. Control systems.

PART 2 - PRODUCTS

2.1 INSTRUCTIONS AND MAINTENANCE MANUALS

A. Provide three Instructions and Maintenance Manuals, each complete as follows:

1. Hardback three-ring loose-leaf binders.
2. Title sheet with job name, Contractor's, subcontractor's control subcontractor and related contractor's or material supplier's names, addresses and phone numbers.
3. Index of contents.
4. A signed copy of acknowledgment of instructions to the Owner or his authorized representative. Two additional copies of the signed acknowledgment shall be sent directly to the Architect as soon as possible after receipt.
5. Typewritten operating instructions for the Owner's personnel describing the following for each piece of equipment and systems:

    a. How to start and stop each piece of equipment.
    b. How to set equipment and systems for normal operation.
    c. Normal restarting procedures before contacting the service contractor.
    d. Complete description of functions and operations of each piece of equipment including description of how equipment operates in conjunction with automatic control systems.
    e. Instructions for cleaning, oiling, greasing, fueling and similar tasks.

6. Approved shop drawings and submittal data and parts and maintenance booklet for each item of material and equipment furnished under this Division, including (but not limited to) the following:

    a. Spare parts list and source of supply for each equipment item.
    b. List of valves with location, service, size, model and operating position.
    c. Diagrams clearly indicating automatic control hook-up.

7. Any as-built wiring diagrams as called for in other sections of this division as needed to show how equipment controls interface with related systems.
8. Copies of certificates of inspection.
9. Guarantees.

B. Electronic versions of all instruction and maintenance manuals shall also be provided in PDF form on a thumb drive.

    1. All files shall be organized in a folder structure.
    2. Folders shall be named with the applicable specification section and title.
    3. File names shall begin with a description of the content (i.e., O&M, Warranty, Shop Drawing, etc.) and then include the description of the equipment or material for which the document applies.

PART 3 - EXECUTION

3.1 VERBAL INSTRUCTION

A. Provide verbal, hands-on, operating and maintenance instruction to Owner's authorized personnel for each equipment item and system. Instruction shall be given by competent personnel.

    1. Duration: Total instruction period for all systems of this Divisions 22 and 23 shall be not less than fifteen (15) working days. The Owner reserves the right to audio-tape or video-tape the instruction procedure.

3.2 MANUFACTURERS' SERVICE REPRESENTATIVES

A. Verbal instruction at the site for the following equipment items and systems shall be given jointly by the contractor and the authorized manufacturer's service representative. (Contractor and manufacturer's service representative shall provide instruction to Owner for each equipment item of no less duration than the hours indicated in parenthesis. Duration shall be greater if otherwise specified).

    1. Water Cooled Chillers. (48 hours)
    2. Pumps. (16 hours)
    3. Heat Exchanger. (8 hours)
    4. Air Handling Units. (48 hours)
    5. Exhaust Fans. (24 hours)
    6. Terminal Units. (8 hours)
    7. Controls – Refer to 23 09 23 for requirements.

END OF SECTION 23 05 15

SECTION 23 05 18
PIPING: CONDENSATE DRAIN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide condensate drain piping from cooling coil drain pans.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the Drawings and Specifications.

B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:

1. Air handling equipment with cooling coils.
2. Insulation.

1.4 SHOP DRAWINGS

A. Refer to Section entitled "General Mechanical Provisions".

PART 2 - PRODUCTS

2.1 PIPE

A. Type M hard drawn copper conforming to ASTM Spec. B88.

2.2 FITTINGS

A. Wrought copper, solder joint, pressure type conforming to ANSI B16.22.

2.3 SOLDER

A. Composition SB5 (95/5), Fed. Spec. QQ-S-571d and Class 3 (Sil Fos), Fed. Spec. AA-S-561d, ASTM B32.

PART 3 - EXECUTION

3.1 GENERAL

A. Piping shall be sloped uniformly toward drain, and provided with trap seal having a depth, in inches, equivalent to one and one-half (1-1/2) times the total static pressure of the respective fan system. Traps shall be assembled using elbows and tees with threaded brass plugs to permit cleaning of trap and drain line. Piping shall be installed in a neat manner and shall be not smaller than full size of the equipment drain connection or three-quarters inch (3/4") whichever is larger.

3.2 JOINTS AND CONNECTIONS

A. General: Joints and connections shall be made permanently air, gas, and water tight.

B. Solder Joints: Cut pipe square using cutting tool which does not crimp pipe. Remove all burrs using pipe reamer and taking care not to flare the pipe end. Thoroughly clean the outside of pipe and the interior of the fittings using a fine sand cloth. Apply noncorrosive paste flux to the cleaned surfaces immediately and apply solder and heat, in accordance with manufacturer's instructions, to complete joint.

C. Equipment Connections: Connections to copper drain nipples may be made with solder joints provided care is exercised not to damage equipment, its insulation or finish. Connections to equipment having steel nipples shall be made using screwed to solder adapters with teflon tape applied to male threads prior to assembly.

3.3 ROUTING

A. Unless otherwise indicated, route pipe discharge as follows:

1. Roof Mounted Equipment: To nearest roof drain.
2. Interior Equipment: To nearest floor drain.

3.4 INSULATION

A. Insulate if so specified in section describing insulation.

END OF SECTION 23 05 18

SECTION 23 05 48
VIBRATION ISOLATION EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide vibration isolation supports for all equipment and piping as may be required to prevent transmission of vibration to building structure. This shall include air handling units, fans, piping, pumps and similar items.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the drawings and specifications.

1.4 SHOP DRAWINGS

A. Refer to Section entitled "General Mechanical Provisions". Submittal data shall show type, point loading information, size and deflection of each isolator proposed and any other information as may be required for the Architect/Engineer to check isolator selections for compliance with specifications. Include clearly outlined procedures for installing and adjusting the isolators.

1.5 MANUFACTURERS

A. Products of the following manufacturers will be acceptable, provided they comply with all of the requirements of this specification: Consolidated Kinetics; Mason Industries; Amber-Booth; Keflex; Flexonics; Vibration Eliminator Company or equivalent. Any model numbers listed are from one or more of these manufacturers and are given to provide an example of item(s) required.

1.6 OTHER REQUIREMENTS

A. All vibration isolation equipment shall be both recommended by the manufacturer and approved by the Architect/Engineer for each particular application on this project.

PART 2 - PRODUCTS

2.1 BASIC REQUIREMENTS

A. Unless otherwise noted, spring type vibration isolators shall be used for all motor driven equipment. It shall be the responsibility of isolation manufacturer to determine the amount of spring deflection required for each isolator to achieve optimum performance, prevent the transmission of objectionable vibration and meet noise criteria referenced herein.

2.2 CORROSION PROTECTION

A. Steel components shall be phosphated and painted. All nuts, bolts and washers shall be zinc-electroplated. Structural steel bases shall be thoroughly cleaned of welded slag and primed with zinc-chromate or metal etching primer.

B. All isolators exposed to weather shall have steel parts PVC coated or hot-dip galvanized. Aluminum components shall be etched and painted. Nuts, bolts and washers may be zinc-electroplated.

2.3 BASIC ISOLATORS

A. General: Unit designations indicated are Architect/Engineer designations. Each of the following basic isolators may not be applicable to a specific installation application. See PART 3, "EXECUTION".

B. Spring Mounts, Open Type, Unrestrained (Unit SMOU): Free standing springs; laterally stable; minimum horizontal-to-vertical spring rate (Kx/Ky) of 1.0: 1/2-inch neoprene acoustical friction pads between bottom baseplate and the supporting surface; leveling bolts; provision for bolting the mount to the equipment (unless otherwise specified); spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection; 1-inch minimum static deflection (unless otherwise specified); submittals shall include spring diameters, deflections, free spring heights, solid spring heights and operating heights. Be similar to Mason Type SLF; Korfund Series L; Amber-Booth Type SW.

C. Spring Mounts, Open Type, Restrained (Unit SMOR): Free standing springs; laterally stable; 1/2 inch neoprene acoustical friction pads between bottom baseplate and the supporting surface; leveling bolts; provision for bolting the mount to the equipment (unless otherwise specified); spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection; 1-inch minimum static deflection (unless otherwise specified); restraint consisting of welded steel channel ends for outdoor installation and welded steel studs for indoor installation; restraint shall have restraining bolts connecting top plate and lower housing to limit vertical rise of isolated equipment when load is reduced; vertical clearance of 1/8 to 3/8 inch shall be maintained between spring top plate and housing (leveling bolts shall be adjusted to maintain this clearance). Submittal shall include spring diameters, deflections, free spring heights, solid spring heights and operating heights. Be similar to Mason Type SLR; Amber-Booth Type CT.

D. Spring Mounts, Housed, Unrestrained (Unit SMHU): Springs free standing within their housing; laterally stable; 1/2 inch neoprene acoustical friction pads between bottom baseplate and the supporting surface; leveling bolts; provision for bolting the mount to the equipment (unless otherwise specified); spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection; 1-inch minimum static deflection (unless otherwise specified); welded steel housing; vertical clearance of 1/8 to 3/8 inch shall be maintained between spring top plate and housing (leveling bolts shall be adjusted to maintain this clearance). Submittal shall include spring diameters, deflections, free spring heights, solid spring heights and operating heights. Be similar to Mason Type C.

E. Neoprene and Spring Hangers, Vertical Deflection (Unit NSHV): Steel housing for undampened support of the spring: Provisions for attachment of hanger rods; reinforced neoprene washer and grommet to break up metal to metal contact; free standing spring; 1 inch minimum static deflection (unless otherwise specified) spring diameters not less than 0.8

of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection. Submittals shall include spring diameters, solid spring heights, free spring heights, deflections, overall hanger dimensions and maximum hanger rod diameter which can be accommodated by the hanger. Be similar to Mason Type DNHS: Amber-Booth Type BSR.

F. Neoprene and Spring Hangers, Vertical and Angular Deflection (Unit NSHVA): Shall contain a laterally stable steel spring and 0.3" reflection neoprene or fiberglass element in series. A neoprene neck shall be provided where the hanger rod passes through the steel box supporting the isolator mount to prevent metal to metal contact. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Mason Type 30N.

G. Neoprene and Spring Hangers, Vertical Deflection, Position Type (Unit NSHVP): Steel housing for undampened support of the spring; provisions for attachment of hanger rods; reinforced neoprene washer and grommet to break up metal to metal contact; free standing spring; 1 inch minimum static deflection (unless otherwise specified); spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection; be capable of holding the supported item at fixed elevation during installation with secondary adjustment to transfer the load to the spring while maintaining a fixed position; scale and pointer to indicate the deflection. Submittals shall include spring diameters, solid spring heights, free spring heights, deflections, overall hanger dimensions and maximum hanger rod diameter which can be accommodated by the hanger. Be similar to Mason Type PCDNHS: Amber-Booth Type PBS.

H. Neoprene and Spring Hangers, Vertical and Angular Deflection, Position Type (Unit NSHVAP): Shall contain a laterally stable steel spring and 0.3" deflection neoprene or fiberglass element in series. A neoprene neck shall be provided where the hanger rod passes through the steel box supporting the isolator mount to prevent metal to metal contact. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Be capable of holding the supported item at the fixed elevation during installation with secondary adjustment to transfer the load to the spring while maintaining a fixed position; scale and pointer to indicate the deflection; similar to Mason Type PC30N.

I. Neoprene-In-Shear Hangers (Unit NH): Steel housing for undampened support of the neoprene; provisions for attachment of hanger rods; neoprene-in-shear isolator; similar to Mason Type HD, Amber-Booth Type HRD.

J. Neoprene-In-Shear Mounts (Unit NM): Double deflection neoprene-in-shear mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene-covered. The top and bottom surfaces shall be neoprene ribbed and bolt holes shall be provided in the base. On equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to compensate for the overhang; steel rails shall be by same manufacturer as vibration isolators and equivalent to Mason Industries Type DNR. Mounts shall be Mason Industries Type ND, Consolidated Kinetics Type RD or Vibration Mounts and Controls Series RD.

K. Flexible Pipe Connectors: Same internal diameter as the pipe in which the connector is installed (not necessarily internal diameters of inlets or outlets of equipment).

1. Both recommended by the manufacturer and approved by the Architect/Engineer to be suitable for handling the conveyed fluid at all conditions (maximums and minimums of temperatures, pressures, velocities, etc.) encountered for each particular application.
2. Of proper design to absorb the combination of vibratory and/or expansion or contraction motions (lateral and/or axial and/or angular) encountered at each installation point (for example, do not use hose type where axial motion is encountered at the installation point unless so recommended by the manufacturer and approved by the Architect.
3. Stainless steel bellows type (Unit SSB): Heavy duty steel restraining rods and spacers; laminated steel bellows; steel flanges; permit axial, lateral and angular movement; rated to withstand 180°F operating temperature and 150 psig working pressure for chilled water; 250°F operating temperature and 150 psig working pressure for heating hot water; similar to Keflex Series 151 or 301.
4. Stainless steel hose type (Unit SSH): Rated to withstand 180°F operating temperature and 150 psig working pressure; have flanges except 2-1/2 inch and smaller sizes may have screw type fittings installed with a union at one end or with screw-on flanges at both ends; net flexible lengths shall be at least 6 pipe diameters for pipe up to 5 inch ID and not less than 36 inches for pipe 6 inch ID and greater; corrugated bellows with stainless steel wire braid restraining sheath; similar to Flexonics Type RW, RF or Series 400, Mason Type BSS, Keflex Series SSH.

L. Acoustic Seals (Unit AS): Consist of an S-shaped molded synthetic rubber seal attached with stainless steel clamps to the pipe wall sleeves and to carrier piping. Wall sleeves shall be two pipe sizes larger than the carrier pipe and/or its insulation. Amber-Booth Type 301.

M. Inertia Bases (Unit IB):

1. Weigh at least 1.5 times the weight of the particular machine being supported.
2. Rectangular welded structural channel steel perimeter frame.
3. Reinforced concrete.
4. Height saving support brackets.
5. Width and length at least 6 inches beyond machine's overall width and length (if necessary, larger for pumps as required to support suction and discharge wells).
6. Structural steel channel depth and concrete base depth shall be a minimum of 1/15th of the longest base dimension but not less than 6 inches.
7. Forms shall include 1/2 inch (or larger if necessary) steel reinforcing bars welded in place on 6 inch centers running both ways across the width and length in a layer 1-1/2 inches above the bottom of the base. Drilled steel members with sleeves welded below the holes to receive equipment anchor bolts.
8. Similar to Mason Type KSL Base.

N. Steel Equipment Frames (Unit SEF): Frames shall consist of structural steel sections sized, spaced and connected to form a rigid base which will not twist, rack, deform or deflect in any manner that will negatively affect the operation of the supported equipment or the performance of the vibration isolation mounts. Frames shall be of adequate size and plan form to support basic equipment units and motors plus any associated pipe elbow or duct elbow supports and electrical control elements or other components closely related and requiring resilient support in order to prevent vibration transfer from equipment to the building structure. Frames shall include side mounting brackets for attachment to Unit SMOU isolator or other specified isolator. The clearance between the underside of any frame or mounted equipment unit and the top of the building structure below shall be at least 2 inches.

O. Neoprene Pads (Unit NP): Waffle or ribbed pattern neoprene pads shall be fabricated from 40-50 Durometer neoprene. Mason Type W.

P. Isolation rails, curb mounted, for roof mounted air handling units (Unit IRCM): Curb mounted roof top units shall each be isolated with a continuous roof top isolation assembly consisting of extruded aluminum rails formed to fit curb and equipment with a flexible air and weather seal continuously joining the two rails and incorporating spring isolators sized for 1" static deflection. Flexible weather seals shall be 1/16th inch thick minimum reinforced Neoprene protected from direct sunlight and accidental puncture by an extruded aluminum shield and shall be capable of being replaced completely without disturbing the unit mounting. Springs shall be stable with a KX/KY (horizontal to vertical spring rate) of 1.0 or greater and be properly sized to support the load at 1" static deflection. Isolation assembly shall have Neoprene cushioned wind restraints which are not engaged in normal operation with sufficient capacity to resist wind load in any direction without distortion or damage to the isolated equipment. Entire assemblies shall be shipped in one piece to eliminate field joint and possible leakage. Mason Industries CMAB.

PART 3 - EXECUTION

3.1 GENERAL

A. All isolators shall be installed in strict accordance with the manufacturer's instructions and shall be properly adjusted prior to requesting final inspection or the performance of any vibration testing specified.

B. Each item of equipment (machinery, piping, etc.) which is provided with vibration isolation equipment shall rest in its intended, proper operating position (i.e. exactly level, etc.) after installation of vibration isolation equipment. Approval of such vibration isolation equipment by Architect/Engineer shall not relieve the Contractor of this responsibility.

C. Equipment which is specified to rest on concrete housekeeping pads shall have Unit NP pads unless otherwise indicated.

3.2 AIR HANDLING UNITS, FACTORY PACKAGED

A. Floor Mounted:
1. Spring mounted (Unit SMOU) with 1 inch minimum static deflection when AHU motor is 5 hp. or less; spring mounts with 2 inch minimum static deflection when AHU motor is 7-1/2 hp. or greater. Instead of bolting the units to the spring mounts, provide height saving brackets.
2. Flexible duct connections as specified in "Duct System Accessories" section.
3. Flexible pipe connectors (Unit SSB).
4. Steel equipment frame (Unit SEF) manufacturer's standard unit frame or base is not sufficiently stiff and rigid to permit point vibration isolation.
5. Mount equipment on reinforced concrete pads as specified in other sections.

B. Suspended from Building Structure:

1. Spring hangers (Unit NSHV) with 1-inch minimum static deflection when motor is 5-HP or less; spring hangers (Unit NSHV) with 2-inch minimum static deflection when motor is 7-1/2 HP or greater.
2. Flexible duct connectors as specified in Section entitled "Ductwork".

3.3 MANUFACTURER'S SUPERVISION

A. The Contractor shall include in his price the cost of the vibration isolation manufacturer or his qualified representative for providing such supervision as may be necessary to assure correct installation and adjustment of the isolators. Upon completion of the installation and after system is put into operation, the manufacturer or his representative shall make a final inspection and submit his report to the Architect/Engineer in writing certifying the correctness of installation and compliance with approved submittal data.

END OF SECTION 23 05 48

SECTION 23 05 93
PERFORMANCE VERIFICATION, PRELIMINARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Put all work in a state of readiness for final performance verification.

B. Final performance verification shall not begin until the systems are complete and operable in all respects and all related building systems are complete.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

B. Refer to the section which describes "Performance Verification, Final".

PART 2 - PRODUCTS

This section not applicable.

PART 3 - EXECUTION

3.1 AIR SYSTEMS

A. Prepare the air side for balancing in the following manner:

1. All fans, blowers, and air handling equipment shall be mechanically checked and available to operate under design conditions.
2. All splitters, volume dampers, fire dampers, and vanes shall be in their neutral positions.
3. All grilles, diffusers, and like items, shall be installed with dampers, vanes, and blades in their neutral positions.
4. All controls, whether they are electronic, electric or pneumatic or a combination thereof, shall be mechanically checked and ready to operate under design code in an operable and non-overloading condition.

3.2 ADDITIONAL REQUIREMENTS

A. Complete Installation: The Contractor shall complete the equipment and system installation to the satisfaction of the Architect/Engineer (who will be the sole judge of its state of readiness) prior to advising, the writing, that final performance verification is ready to begin. The Contractor is hereby advised that the Certificate of Substantial Completion will not be issued prior to the completion of final performance verification work and that he should therefore, schedule all other work accordingly allowing no less than 60 days for completion of final performance verification.

B. Correction of Defects: The Contractor shall promptly and properly correct all defects in workmanship, material, installation and equipment of which he is aware prior to requesting that final performance verification work begin. Once the final performance verification work has begun, the Contractor shall promptly correct all defects in workmanship, materials, installation, and equipment as they are called to his attention by Architect/Engineer.

C. Drive Changes: Changes in pulleys or belts required for correct final balance during testing shall be made at no additional cost.

D. Scheduling and Coordination: The Contractor shall be responsible for proper scheduling and coordination of work involved in preliminary performance verification. This shall include, but is not necessarily limited to the timely provision of: mechanics, tools, equipment, correction of defects, equipment manufacturer's representatives, test modules, and all other items which may be required.

E. Report: Submit a written report describing and certifying in detail all preliminary performance verification items and tasks that have been performed. Approval of this report by the Architect/Engineer will precede final performance verification.

END OF SECTION 23 05 93

SECTION 23 05 94
PERFORMANCE VERIFICATION, FINAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide the services of an independent test and balance agency to verify the performance of the complete heating, ventilating and air conditioning systems as described by Division 23. Performance verification shall be accomplished by established testing and balancing procedures as described in this section.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

1.4 TEST AND BALANCE AGENCY

A. All performance verification shall be performed by an independent test and balance agency (herein referred to as the "T & B Agency") which is fully certified by and a current member of the Associated Air Balance Council (AABC).

1.5 CONTRACTUAL RELATIONSHIP

A. Performance verification shall be performed as a service of the T & B Agency directly to the Contractor with no other subcontractors as part of the agreement.

B. Performance verification is specified in this Division 23 only because it relates predominantly to Division 23 work. However, the inclusion in this Division 23 of this section covering performance verification shall not preclude the contractual agreement of the T & B Agency from contracting directly to the Contractor with no other subcontractors as part of such agreement.

1.6 AGENCY APPROVAL

A. Submit the name and qualifications of the proposed T & B Agency to the Architect/Engineer for approval within thirty (30) days of Notice to Proceed.

B. Include AABC National Project Certification Performance Guaranty.

1.7 WORK INCLUDED

A. The T & B Agency shall provide all labor, supervision, professional services, tools, test equipment and instruments (except as otherwise specified) to perform the following work and all other work of this section:

1. Review the automatic temperature control and air terminal unit specifications for their respective and combined effects on the testing and balancing procedures for the air and hydronic systems.
2. Where in the opinion of the T & B Agency conditions may exist in the system design or construction that may have the potential of adversely affecting system performance, then the T & B Agency shall identify the condition and submit in writing recommended correctives for consideration by the Architect/Engineer.
3. During construction, review those shop drawings which have relevance to performance verification to confirm that the required piping, ductwork and equipment, and their respective specialties and accessories such as gauges, valves, dampers, access doors, etc., are properly selected, sized and located to permit proper and complete testing and balancing to be accomplished.
4. Perform site inspections to verify compliance with documents, and observe pressure tests on ductwork.
5. Perform a complete air and hydronic test and balance of all heating, ventilating, air conditioning and exhaust air systems and all water and steam systems shown and described on the Construction Documents and as further described herein.
6. Submit Equipment Test and Systems Balance Report.
7. Furnish specifications to Contractor for properly sized fixed sheaves on fan systems after proper RPM has been established.

1.8 EXISTING SYSTEMS

A. Prior to balancing and testing the new systems, obtain test data on those existing systems which may be affected by the new work. Then, after the new work is provided, rebalance (if and as necessary) those existing systems so that they operate at the same conditions under which they were operating prior to the new work.

B. The above test data shall be provided as part of the test and balance report. The test data shall include the water and air flow rates and temperatures entering and leaving any equipment items which are part of the existing heating, ventilating and air conditioning system. However, only the fluid affected by the new work need be tested (for example, an air handling unit which is unaffected on its airside but which is affected on its waterside need only have water data obtained). Also, if a piping system branch serves a group of units, then only the flow at the existing branch need be measured and not necessarily the flow at each air handling unit served by the branch (unless measurement at each unit is the only way to obtain the branch total flow).

1.9 GUARANTY

A. The T & B Agency shall include a warranty period of ninety (90) days after completion and acceptance of test and balance work. During the warranty period, the Architect/Engineer may request a re-check or re-setting of any system component requiring testing and balancing. The T & B Agency shall provide technicians, instruments, and tools to assist the Architect/Engineer in conducting any test that he may require during this time. The foregoing shall be in addition to the A.A.B.C. National Project Certification Performance Guaranty which shall also be provided.

PART 2 - PRODUCTS

2.1 GENERAL

A. The tangible product of this section shall include the reports and documentation necessary to verify the systems' performance.

2.2 REPORT

A. The T & B Agency shall in the course of his work record the information herein specified. Recorded test data shall be at the final balanced condition for each system. Recorded data shall be arranged by system using the appropriate designation as established on the Construction Documents. Four (4) copies of the final report signed, bound and indexed shall be submitted to the Architect/Engineer for his approval or comments.

B. Where actual measurements recorded for the final balance show deviations of more than 10% from the design, the T & B Agency shall note same in the report and submit recommendations for corrective action to the Architect/Engineer for his consideration.

C. In those cases where recorded data can be reasonably interpreted to be inaccurate, inconsistent and/or erroneous, the Architect/Engineer may request additional testing and balancing. The T & B Agency shall at no additional cost perform such retesting and rebalancing as directed by and in the presence of the Architect/Engineer.

D. Where, in the opinion of the T & B Agency, there is excessive vibration, movement or noise from any piece of equipment, ductwork, pipes, etc., the T & B Agency shall note same in the report and submit recommendations for action to the Architect/Engineer.

E. The T & B Agency shall verify that each thermostat and the devices it is controlling, such as control valves, motorized dampers, VAV boxes, etc., operate in the exact sequence required.

F. Test Data: Include the following data in the Systems Test and Balance Report:

1. Motors:
   Manufacturer
   Model and serial number
   Rated amperage and voltage
   Rated horsepower
   Rated RPM
   Corrected full load amperage
   Measured amperage and voltage
   Calculated BHP
   Measured RPM
   Sheave size, type and manufacturer

2. Fans:
   Manufacturer
   Model or Serial number, BI or Air Foil - number of blades
   Rated CFM, measured CFM
   Rated RPM, measured RPM
   Measured pressures - Inlet and Outlet Static Pressure
   Pulley size, type and manufacturer
   Belt size and quantity
   Rated TSP
   Operating TSP & operating ESP (at discharge side of
   Supply Fan or suction side of Exhaust/Return Fan)

3. Air Systems (including inlets and outlets):
   Provide single line diagrammatic plan locating each air inlet and outlet and its reference number.
   Grille or diffuser reference number and manufacturer.
   Grille or diffuser location.

Design velocity.
Design CFM.
Effective area factor and size.
Measured velocity.
Measured CFM
Terminal Unit CFM

G. Other Report Requirements: Where any systems have equipment or components which are not covered by the above, then the Final Test and Balance Report shall include the following data as applicable to such equipment or systems to confirm actual operation:

1. All inlet and outlet areas.
2. All applicable duct, pipe and coil sizes.
3. Outside, inside, mixed and supply air conditions.
4. All speeds.
5. All voltage and ampere ranges.
6. Descriptions of each test method used.

2.3 INSTRUMENTATION

A. All test and balance equipment and instruments to be furnished by the T & B Agency shall have been calibrated within six (6) months of use on this work. A list of equipment and instruments to be used shall be submitted to the Architect/Engineer prior to commencing test and balancing operations and shall include equipment and/or instruments, name, manufacturer, serial number and certification of last calibration date. Instruments without calibration adjustment capability shall be accompanied with manufacturer's certification of accuracy. Test and balance equipment and instruments furnished by the Contractor to the T & B Agency shall be accompanied with certification as required above. The T & B Agency shall be responsible for the protection from damage due to accident, abuse or misuse, all equipment and instruments provided by the Contractor, and shall return same in good working condition at the completion of the test and balance work to the Contractor. The T & B Agency shall repair at his expense to original condition and accuracy or replace with like equipment and instruments damaged in the work.

2.4 DIAGRAMS

A. Provide a schematic diagram (i.e., one-line) of duct system(s) tested. Indicate on the diagram the relative location of all air distribution devices, VAV boxes, heating/cooling coils, points of data measurements (i.e., pitot traverse, temperature, static pressure) fans, air handling units, and similar equipment included in the system. Diagram shall identify each component tested. Said identification shall utilize the conventions shown on the drawings (i.e., AHU-1 or SF-6) and correlate with the data sheets provided in the Test and Balance Report.

2.5 LOGS AND FORMS

A. Logs and forms shall clearly indicate following:

1. All inlet and outlet areas.
2. All applicable duct, pipe and coil sizes.
3. Outside, inside, mixed and supply air conditions.
4. All fluid velocities, flow rates, temperatures and pressures at significant locations (e.g., fluid pressures before and after each pump and fan, temperatures and pressures at supply and return headers and at chiller and boiler inlets and outlets, etc.).
5. All fan speeds.

6. All motor ampere ranges.
7. Descriptions of each test method used.

B. Associated Air Balance Council log and data forms.

PART 3 - EXECUTION

3.1 GENERAL

A. Sheaves: The Contractor shall provide applicable fans with V-belt drives and fixed pitch sheaves. In order to provide the properly sized fixed pitch sheave, the Contractor shall initially provide fans with V-belt drives, variable pitch sheaves. The Contractor, upon completion of system balancing by the T & B Agency, will replace these adjustable pitch sheaves with fixed sheaves of the size and type specified by the T & B Agency. The Contractor shall tag the adjustable sheaves, transmit same to Owner, and receive written receipt by Owner of acceptance of these sheaves.

B. Load Conditions: All testing and balancing of systems shall be undertaken with maximum attainable load. Testing and balancing of all air handling systems shall be accomplished with ceiling tile in place and enclosing partitions and doors erected.

C. Observe all equipment and exposed piping for noise, movement or vibrations under normal operating conditions and report excesses to the Architect and Owner.

D. Where patented measuring stations are installed, each of these is to be read and recorded. In the hydronic systems, the permanent devices, such as flow tubes with mercury manometers, annular ring systems, venturi tubes with portable meters, etc. must be used for final measurements after they are completed, calibrated and in satisfactory condition.

3.2 PERFORMANCE VERIFICATION, PRELIMINARY

A. The Contractor, prior to commencement of the balancing by the T & B Agency, shall verify in writing:

1. That strainers have been removed and cleaned.
2. That all air filters have been installed and are in clean condition.
3. That expansion tanks have been inspected and that the system is not air bound and is completely filled with water.
4. That all air vents at coils and high points of the piping systems have been inspected and are installed and operating freely.
5. That all automatic valves, hand valves, and balancing valves have been left or fixed in the open position for full flow through all devices.
6. That all linkages between valves or dampers and their actuators are secure.
7. That all pumps and fans are operating at the specified RPM.

B. The Contractor shall confirm in writing that the systems as scheduled for balancing, are operational and complete and that all piping and ductwork have been pressure tested and accepted and all affected piping systems have been cleaned, flushed and refilled with prescribed treated water and vented.

3.3 PROTECTION OF WORK

A. The Contractor shall protect all mechanical devices during the testing and balancing period. The activities of the T & B Agency will include but not be limited to the adjustments of designated balancing devices including; adjustment of balancing dampers, adjustment of inlet

vane dampers, adjustment of air extractors, air splitters, or manual dampers, the adjustment of adjustable sheaves for fan speed, the adjustment of balancing valves, or similar devices. The existence of the T & B Agency shall not relieve the Contractor of his responsibility for the complete operation of the mechanical systems in conformance with the contract documents.

3.4 CORRECTION OF WORK

A. The Contractor shall at no additional cost to the Owner rectify discrepancies between the actual installation and contract documents when in the opinion of the T & B Agency the discrepancy will significantly affect system balance and performance.

3.5 COORDINATION AND ASSISTANCE

A. The Contractor shall assist the T & B Agency by providing all labor, equipment, tools and material required to operate all of the equipment and systems necessary for the testing and balancing of the systems and for the adjustment, calibration or repair of all electric or pneumatic or automated control devices and components. These services shall be available on each working day during the period of final testing and balancing. The Contractor shall assist the T & B Agency by arranging to have all ceilings, partitions, windows, and doors installed prior to the scheduled commencement of balancing within each specified area.

B. The Contractor shall provide to the approved T & B Agency a complete set of plans and specifications and an approved copy of all heating, ventilating and air conditioning equipment shop drawings. The Contractor shall include the cost of all pulley, belt, and drive changes, as well as balancing dampers required to achieve proper system balance recommended by the T & B Agency.

3.6 AIR SYSTEMS

A. The testing and balancing shall include, but is not limited to, the following requirements:

1. Adjust fan speeds to deliver the required cfm and static pressure, and record rpm and full load amperes.
2. Make pitot tube traverse of main supply ducts to verify design cfm. Seal duct access holes with rubber or metal snap-in plugs.
3. For each supply air system, verify the quantity of outside air and return air when the system is operating in the maximum cooling and full heating modes.
4. Test and adjust each diffuser, grille and register to within 10% of design requirements, and also adjust so as to minimize drafts in all areas.
5. Observe all equipment and exposed ductwork for noise, movement or vibration under normal operating conditions and report excesses to the Architect/Engineer.

B. After all air distribution devices have been balanced to distribute calculated design indicated air quantities and if temperature in any area (where such area does not have the particular zone temperature control thermostat located therein) of any zone is not maintained within 2 degrees plus or minus of the zone areas which does have the zone temperature control thermostat, then notify Architect/Engineer of such conditions and obtain approval to rebalance devices to obtain air quantities other than those indicated so that air temperature in entire zone will be as even as possible regardless of calculated design air quantities. After obtaining approval to rebalance, perform such necessary rebalancing.

END OF SECTION 23 05 94

SECTION 23 07 00
INSULATION, HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide all work necessary to insulate all equipment, piping, ducts and other items related to the piping and duct systems.

1.3 RELATION TO OTHER WORK

A. Refer to the section, General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the Drawings and Specifications.

B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:

1. Duct systems.
2. Cooling equipment.

C. Vessels, tanks, stacks, and other items which contain or convey fluids which are at such temperatures as to create condensation or surface temperatures which are hazardous or where heat loss or gain prohibits proper system operation.

1.4 SHOP DRAWINGS

A. General: Refer to the Section entitled "General Mechanical Provisions". Shop drawings shall contain complete descriptive and engineering data, including flame spread and smoke developed ratings (ASTM E84 test method) on all materials and adhesives. Where finishes, covers, or jackets are specified, provide complete data on same. Shop drawings shall contain specified information on: densities, conductivities, conductances, or resistances as required to establish conformance with the specified values or materials.

B. Industry Standards: Where compliance with an industry, society or association standard is specified or indicated, certification of such compliance shall be submitted with shop drawings.

C. Commencement of Work: Submit shop drawings before any work is commenced.

1.5 STORAGE OF MATERIALS

A. Do not store fiberglass insulation within the building until it has been "dried in". If no other dry space is available and this insulation must be installed or stored before the building is "dried in" and completely enclosed, provide polyethylene film cover for protection.

1.6 COMPLIANCE WITH CODES AND STANDARDS

A. Applicable Codes: The total insulation system including insulation, sealant, finishes, etc., shall comply with or exceed all code requirements.

B. NFPA: All materials and adhesives used shall conform to the requirements of NFPA 90A as to flame spread and smoke developed ratings.

1.7 DEFINITIONS AND TERMINOLOGY

A. Terminology: Throughout this section, insulation products may be described as regards the location, surface or other point at which they are to be applied. Except in special cases (where a detailed indication or description will be given), the majority of conditions can be defined in whole or in part by use of (but not necessarily limited to) any or all of the following words:

1. "Internal" or "External".
2. "Interior" or "Exterior".
3. "Concealed" or "Exposed".
4. "Protected" or "Unprotected".

B. Definitions: Wordage used to describe locations, surfaces or other points or conditions shall be defined as follows as related to this section. Where the ascertainment or determination of locations, surfaces and other conditions is obvious from the intent of use of the item (e.g., roof-mounted ductwork, underground piping, etc.) or from other information, then the following words may not be required. If any ambiguity should occur, provide bid based on the most severe condition; however, obtain clarification from Architect/Engineer prior to installation:

1. "Internal" and "External": Relates to an item or its surface which is to be insulated or uninsulated. Does not relate to the confines of the building, structure or other entity in which the item is located. (Examples: internal/external surfaces of ductwork, pipe, air handling units or other such items.)
2. "Interior": Relates to the location of an item as to whether the item is within a heated, ventilated, air conditioned or otherwise controlled environment of the building, structure or other entity in which the item is located. "Interior" is always "Protected". (Examples(s): Interior ductwork, interior piping, interior air handling units.)
3. "Exterior": Relates to the location of an item as to whether the item is outside (i.e., exterior to) a heated, ventilated, air conditioned or otherwise controlled environment of the building, structure, facility or other entity which the item serves or relates. "Exterior" generally means that the item is surrounded by the ambient outside environment. "Exterior" is considered "Unprotected" unless otherwise described. (Examples(s): exterior rooftop air handling units, exterior ductwork, exterior cooling tower.)
4. "Concealed" and "Exposed": Relates to the visibility of an item. "Concealed" implies out-of-sight from normal view by an occupant, user or employee of the facility when such person is performing their normal function. "Exposed" implies that the item is readily visible by such a person when that person is performing a normal function. (Examples(s): "Concealed interior ductwork" would be out-of-sight in a ceiling plenum, whereas "exposed interior ductwork" would be readily visible in a mechanical equipment room or in a room which intentionally had no ceiling system.)
5. "Protected" and "Unprotected": Relates to an exterior item which may or may not be sheltered from the outside elements but which exists in contiguous contact with the ambient environment without benefit of any direct heating, ventilating or air conditioning. (Example(s): Piping or ducts located in an open crawl space beneath a building would be "protected/concealed"; in an open parking garage such piping or ducts would be "protected/exposed". Piping or ducts on a rooftop would be "unprotected" and usually "exposed".)

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials: Materials listed are those used as basis of design; equivalent products of acceptable manufacturers will be accepted. Materials must be approved and recommended by the insulation product manufacturer for the particular application(s).

B. Flame and Smoke Ratings: Application of insulation materials may require, in many cases, that the final insulation system comply with NFPA 90A with regard to maintaining a flame spread rating of 25 or less and a smoke developed/fuel contributed valve of 50 or less. In such cases, verify that the materials comply with the indicated flame spread and smoke developed ratings.

C. Applicability: Products and manufacturers listed may not all be applicable. Use only those products and manufacturers which are indicated as being applicable to a specific insulation condition.

D. Acceptable Manufacturers: Manufacturers which are listed are those manufacturers who may make one or more of the insulation products required. Listing of a manufacturer does not necessarily mean the manufacturer is approved for all applicable insulation conditions. Each listed manufacturer must still comply with the specific requirements of each insulation condition to be acceptable for the particular application. Acceptable manufacturers of insulation-related products include (but are not necessarily limited to) the following: Armstrong; CertainTeed; Childers Products Co.; Knauf; Manville; Owens-Corning; Pittsburg Corning; Rubatex; Upjohn Co.; Duracote Corporation; Ferro Corporation; Dow Corning Corporation; Duro Dyne Corporation; Goodloe E. Moore, Inc.; 3M Co.; United McGill Corporation, Vimasco Corporation; Foster; Gustin-Bacon; Nomaco Inc.; Insulcoustic; Molded Acoustical Products; Lion Nokorode and other manufacturers as may be listed for a specific application.

2.2 BASIC MATERIALS

A. Cellular Glass Insulation: Preformed or block type as indicated or as applicable. Fire, water and vermin retardant; closed cell glass composition; density of 8.5-pcf. Comply with the following: ASTM C 552, "Specification for Cellular Glass Thermal Insulation"; Military Specification MIL-I-24244B. Flame spread rating of "5" and a smoke developed rating of "0" as per ASTM E 84. Recommended temperature applications from -450°F to 1200°F when installed in accord with manufacturer's recommendations. Pittsburg-Corning Foamglas.

B. Elastomeric Insulation: Preformed (tube), roll or sheet as indicated or as applicable. Nitrile, rubber based, closed cell structure. K factor of 0.28 at 75°F. In tube, roll or sheet form of 3/4-inch thickness or less, ASTM E 84 flame spread rating of "25" or less and smoke developed rating of "50" or less. Recommended temperature applications from -40°F to 220°F when installed in accord with manufacturer's recommendations. Do not install in return air plenums unless flame spread rating and smoke developed rating are within constraints of applicable codes. Manufacturers and/or series: Armstrong "Armaflex"; Manville "Aerotube"; "Rubatex"; Gustin-Bacon "Ultra-Foam".

C. Fiberglass Insulation: Inorganic fibrous glass. Flame spread of "25" or less and smoke developed rating of "50" or less per ASTM E 84.

1. Board: Rigid or semi-rigid form, faced or unfaced as indicated. Stiffness of 475 EI, 800 EI or 1400 EI as indicated.
2. Blanket: Flexible form; faced, unfaced or coated as indicated.

3. Preformed: Jacketed or unjacketed as indicated.

D. Calcium Silicate Insulation: Preformed or block type as indicated or as applicable. Asbestos free. Rigid hydrous calcium silicate. K factor of 0.42 at 200°F. Density: 14-pcf. Flame spread rating of "0" and smoke developed rating of "0" as per ASTM E 84. Recommended temperature applications up to 1200 °F. Use where indicated only on equipment and surfaces which generate heat; do not use as a cold-surface insulation.

2.3 INSULATION PRODUCTS, BASIC

A. Type I-1: Cellular glass block insulation. Field formed, fitted and finished as required for the application. Pittsburg-Corning Foamglas or equivalent.

B. Type I-2: Calcium silicate block insulation. Field formed, fitted and finished as required for the application. Owens-Corning Kaylo; Manville Thermo-12; or equivalent.

C. Type I-3: Elastomeric insulation. Field formed, fitted and finished as required for the application. Armaflex, Rubatex or equivalent.

D. Type I-4: Fiberglass flexible blanket insulation. Unfinished, non-combustible, wool-like; composed of long glass fibers bonded with a thermosetting resin. Thermal conductivity (K) of 0.23 at 100°F. Applicable where indicated for boilers, vessels, breaching and stacks operating at up to 1000°F. Finished or held in place by wire ties, metal lath, lagging or as indicated. Owens-Corning Thermal Insulating Wool TIW Type II or equivalent.

E. Type DI-1: Duct insulation, fiberglass flexible blanket wrap. Composed of flexible blanket of glass fiber factory laminated to a reinforced foil kraft (FRK) vapor barrier with a minimum 2-inch taping and stapling flange on one edge. Suitable for operation at temperatures from 40°F to 250°F. Thermal conductivity of 0.31 at 75°F. Minimum density of three-quarter (3/4) pound per cubic foot. Provide in thickness of (2.2) inches unless otherwise specified as 2-1/2 or 3-inch thickness. Owens-Corning All Service Faced Duct Wrap; Manville R-Series Microlite; CertainTeed Standard Duct Wrap; or equivalent.

F. Type DI-2: Duct insulation, fiberglass semi-rigid board. Composed of resin bonded glass fibers faced with a foil scrim-kraft (FSK) reinforced laminate of aluminum foil and kraft bonded to provide a metallic surface finish vapor barrier; alternate vapor barrier facing (if specifically indicated) is an all service jacket (ASJ) of high intensity white bleached, chemically treated kraft paper reinforced with fiberglass yarn mesh and laminated to aluminum foil with fire-retardant adhesive to impart a clean, white appearance. Conductivity (K) of not greater than 0.23 at 75°F. Provide in thickness of one (1) inch unless otherwise indicated. Provide with minimum density of 3-pcf unless 6-pcf is specifically indicated. CertainTeed Industrial Insulation Board Type IB-300 (or IB-600); Manville 800 Series Spin-Glas Type 814 (or 817); Owens-Corning 700 Series Industrial Insulation Board Type 703 (or Type 705); or equivalent.

2.4 INSULATION ADHESIVES, MASTICS, SEALANTS

A. Adhesive (Type A-E1): For joints and seams in elastomeric insulation (Type I-3) not requiring weather protection. Rubatex R-373 Insulation Adhesive; Armstrong 520 Adhesive or equivalent.

B. Joint Sealant (Type JS-CG1): Non-hardening vapor barrier sealant specifically designed for use with cellular glass insulation (Types PI-1, I-1): Foster's 35-40 Foamseal Sealant, Pittsburg-Corning Pittseal 111 Sealant or equivalent.

C. Adhesive (Type A-F1): For adhering fiberglass blanket and board insulations (Types DI-1, DI-2) to metal substrate such as ductwork. Insulcoustic I-C 201, Foster 85-20 or equivalent.

D. Mastic, General Purpose (Type M-GP1): Non hardening vapor barrier general purpose mastic. For use where indicated or otherwise applicable. Foster GPM 35-00 or equivalent.

2.5 INSULATION FINISHES, JACKETS AND COVERS

A. Finishing Coating (Type FC-E1): For weather protection of elastomeric insulations (Types I-3, PI-5). Rubatex 374 coating; Armstrong Armaflex Finish or equivalent.

B. Finish Mastic (Type FM-CG1): For cellular glass insulations (Types PI-1, I-1). Waterproof, weather, acid and alkali resistant asphalt mastic coating for use in the range of -40°F to 200°F (installation must be done when in the 50°F to 120°F range). Pittsburg-Corning Pittcote 300 Vapor and Weather Barrier Finish or equivalent.

C. Finish Fabric (Type FF-CG1): For cellular glass insulations (Types PI-1, I-1). 6 x 6 meshes per inch polyester fabric for reinforcing the finish mastic. Pittsburg-Corning PC Fabric 79 or equivalent.

D. Finish Fabric, General Purpose (Type FF-GP1): Nylon membrane. For use generally with fiberglass duct insulations (Types DI-1, DI-2) at joints or seams or as may be indicated. Apply using Foster GPM 35-00 or equivalent.

E. Jacket, Pipe, PVC (Type JP-PVC): All purpose, UL-rated, white vinyl jacket, with or without self-sealing feature. Pittsburg-Corning "UNI-JAC" or equivalent.

F. Jacket, Pipe, Aluminum (Type JP-A1): Aluminum jacketing, 0.016 inches thick, type 3003 alloy, H-14 temper, circumferentially corrugated, with a continuously laminated moisture barrier of one mil polyethylene film and a protective layer of 40 lb. virgin kraft paper. Childers Products Co. "Corolon"; General Aluminum Supply Co. (Gasco); Insulcoustic "Alcorjac" or equivalent.

2.6 RELATED PRODUCTS

A. Wire (Type W-1): Dead soft, 16-gauge, stainless steel.

B. Straps (Type ST-1): Stainless steel T-304 (18-8) soft annealed with deburred edge with stainless steel wing seals. Childers Products "Febstraps" or equivalent.

C. Tape (Type T-1): High tensile strength rope stock flat back paper pressure sensitive tape. Pittsburg-Corning "PC Tape No. 25" or equivalent.

D. Screws (Type S-1): Aluminum pan head type "A" slotted #8 by 1/2-inch.

PART 3 - EXECUTION

3.1 GENERAL

A. Field Forming, Fitting and Finishing: Where preformed insulation products are indicated as being acceptable for a particular application, provide field formed, fitted and finished insulation systems if such application is more practical (such as due to size, configuration or dimensions which may be outside of the availability ranges for size, dimension and/or thickness of preformed products).

B. Pre-installation:

1. Do not apply insulation adhesives, materials or finishes until the item to be insulated has been completely installed and tested and proved tight and suitable for insulation.
2. Prepare surfaces to be clean and dry before attempting to apply insulation.

C. Insulation Shields: Provide hanger or pipe support shields of 16 gage (minimum) galvanized steel over or embedded in the insulation. Shield shall extend halfway up the pipe insulation cover and at least 6" on each side of the hanger. Securely fasten shield with pipe straps at each end.

D. Valves, Cocks and Specialties: Insulate as for the related piping system in which they are located unless otherwise indicated.

E. Factory Pre-insulated Components: Where equipment and other system components are specified in other sections to have factory installed insulation, then no additional insulation is required as work of this section unless additional non-factory-installed insulation is specifically described. Examples of such equipment and components which may not require additional insulation include, but are not necessarily limited to, boiler vessels, chiller evaporators, air handling units, airside terminal units, and similar items.

F. Minimum Thicknesses: Insulation thicknesses which are indicated are minimum thicknesses. Contractor may provide the same insulation material in greater thickness as an aid to installation and handling procedures or due to material availability and procurement considerations.

G. Branch Runouts: Branch runouts are considered to be individual supply/return pipes to individual terminal heating or cooling units (duct mounted coils, airside terminal units with heating coils, fan coil units, humidifiers, and similar small equipment). The supply/return pipe to such units is not considered to be a branch runout if the length of the supply or return pipe exceeds 12'-0" in length to the coil/unit connection.

3.2 DUCT SYSTEMS

A. General:

1. Locations and extent of both internal and external insulation for duct systems are described in section entitled "Ductwork" and/or by the "Duct Type and Location Schedule" on the Drawings.
2. Internal Insulation: Ductwork which is required to be insulated internally (acoustically/thermally lined) shall be insulated as work of the section entitled "Ductwork".
3. External Insulation: Ductwork which is required to be insulated externally shall be insulated as work of this section.
4. Factory Insulation: Ductwork which is factory manufactured with internal or external insulation is not to be additionally insulated as work of this section unless specifically stated. Such factory insulated ductwork generally consists of flexible externally insulated ductwork and double walled acoustically thermally lined ductwork.

B. Interior, Concealed (e.g., ceiling plenums): Where external insulation is required, insulate externally with 2.2 inch thick fiberglass blanket wrap (Type DI-1). Adhere duct insulation using adhesive (Type A-F1) applied in accordance with the manufacturer's recommendations. Where duct width exceeds twenty-four inches (24"), the insulation shall be additionally secured to the bottom of the duct using mechanical fasteners spaced one foot (1') on center. Insulation shall be applied with edges tightly butted, and all joints and breaks in the vapor

barrier sealed using glass fabric and mastic applied in conformance with manufacturer's recommendations.

C. Interior, Exposed, (e.g., air handling unit rooms): Where external insulation is required, insulate with 1-inch thick semi-rigid fiberglass board (Type DI-2). Adhere to ductwork with adhesive (Type A-F1). Finish joints and seams with finish fabric (Type FF-GP1).

3.3 DUCT SYSTEMS EQUIPMENT

A. General: Insulate as follows unless detailed to a greater extent on the Drawings.

B. Fire damper and Fire/Smoke Damper External Surfaces:

1. Externally Insulated Duct Locations: Extend duct insulation up face of fire damper to damper sleeve. Seal insulation edges with 4-inch minimum width duct tape.
2. Internally Insulated Duct Locations: Provide additional external insulation from a point on the duct 12 inches from the fire damper to the fire damper and on the face of the fire damper to the fire damper sleeve. Seal insulation edges with 4-inch minimum width duct tape.

C. Air Distribution Devices: Insulate the backs of all ceiling diffusers and other air outlet devices installed in other than return air plenums as specified for interior concealed ducts.

END OF SECTION 23 07 00

SECTION 23 23 13
REFRIGERANT PIPE, VALVES AND SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide refrigerant piping systems, complete in all respects, between the system components and connected equipment.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the Drawings and Specifications.

1.4 SHOP DRAWINGS

A. Refer to the Section entitled "General Mechanical Provisions".

PART 2 - PRODUCTS

2.1 COPPER PIPE

A. Refrigerant system piping shall be refrigerant grade, dehydrated and sealed, seamless, uniformly dead soft temper.

2.2 FITTINGS

A. Refrigerant grade, wrought copper, long radius, solder joint type.

2.3 SOLDER

A. Silver brazing alloy (Sil Fos) Fed. Spec. AA-S-56ld.

2.4 FLUX

A. Non-corrosive, specifically designed for silver brazing.

2.5 ACCESS VALVES

A. Schrader type designed for use with quick coupler hose fittings and provided with individual cap.

PART 3 - EXECUTION

3.1 PIPE SIZES

A. Refrigerant pipe sizes which may be shown on drawings are nominal. Provide sizes not less than sizes indicated and in compliance with size recommended by the manufacturer(s) at the

connected equipment. Provide change in sizes if such change is in accord with manufacturer's recommendation and with Architect/Engineer's approval. Size piping to maintain minimum velocity of 500-fpm in horizontal lines and 1000 fpm in vertical risers for proper oil return; provide double suction risers and hot gas risers as may be necessary to accomplish this.

3.2 REFRIGERANT SPECIALTIES

A. Refrigerant valves, driers, expansion valves, and similar items shall be provided with each system. Where refrigerant access valves are not furnished by the manufacturer, they shall be field installed to enable charging and checking the system.

3.3 JOINTS AND CONNECTIONS

A. General: All joints and connections shall be made permanently refrigerant tight.

B. Solder Joints: Cut tubing square using tubing cutters, with sharp cutting wheels, so as not to crimp the tubing ends. Remove all burrs using a pipe reamer and taking care not to flare the ends of the tube. Thoroughly clean the outside of the pipe and the inside of the fitting using a fine sand cloth. Apply non-corrosive paste flux to the cleaned surfaces immediately and apply silver solder and heat in accordance with manufacturer's instructions. Use care not to damage equipment or refrigerant specialty items when making up joints (protect from excessive heat).

C. Scale Prevention: During brazing, keep pipe system full of inert gas to prevent scale formation.

D. Mechanical Joints: Where the Contractor uses refrigerant tubing sets, follow the manufacturer's installation instructions explicitly, including the use of special tools, when making up the joints. Where precharged tubing and equipment is provided, do not cut into the system to install access valves.

3.4 HANGERS AND SUPPORTS

A. Refer to other sections describing hangers and supports. Isolate copper tubing from contact with any dissimilar metals.

3.5 EVACUATION AND CHARGING

A. When other than completely factory charged equipment and piping systems are used, they shall be evacuated and charged as follows: Charge the system with dry nitrogen and refrigerant and leak test all joints including factory piping within the units. Repair all leaks by disassembling and remaking the joint. After all leaks are corrected, evacuate the system to an absolute pressure of 0.2" mercury. System shall hold this vacuum for two hours with no noticeable rise in pressure. After passing vacuum test, break vacuum twice using refrigerant and re-evacuate for a minimum of two hours each time. Charge the system in the manner and with the type and amount of refrigerant recommended by the manufacturer and in accordance with accepted refrigeration practice.

3.6 REFRIGERANT PIPING CONDUIT

A. Install any refrigerant piping which is below slab or grade in Schedule 40 PVC piping. Size conduit as necessary to properly install piping. Provide long bend sweeps. Install so that conduit will drain and not trap water. Protect ends of conduit from entry by vermin, insects and water.

3.7 OTHER REQUIREMENTS

A. Arrange piping generally as shown and such that service access is facilitated. Keep refrigerant lines as short and direct as possible with a minimum number of joints. Provide sleeves through floors, walls or ceilings, sized to permit installation of full-thickness insulation; seal air tight after installation of piping and insulation.

B. Provide flexible piping arrangement in hot gas discharge line of compressor. Such arrangement shall consist of a piping loop or similar measure to prevent transmission of objectional vibration.

C. Provide a removable core filter-drier in liquid line. In-line filter-driers are acceptable in individual circuits of less than 10-ton nominal capacity. Provide a full size valved bypass around this filter-drier. Provide shut-off valves to isolate the filter drier while flow is through the bypass and also a shutoff valve in the bypass so that filter-drier can be put into use.

D. Provide a refrigerant charging connection in the liquid line upstream from the filter-drier.

E. Provide a moisture indicating sight glass in the liquid line downstream from the filter-drier. Install in vertical line if possible and a sufficient distance downstream from any valve such that the resulting disturbance does not appear in the glass.

F. Provide a filter-drier with isolating shut-off valves and with valved bypass only if compressor is not equipped with a suction line filter or screen.

G. Keep piping free from traps unless otherwise indicated. Install vertical pipe plumb. Pitch horizontal piping only where slope is desirable.

H. Provide shut-off valves at inlet and outlet to all condensers, receivers and evaporators to permit isolation for service. If possible, use angle valves to minimize pressure drop. Use angle valves in all cases at receivers. Use globe valves only when angle valves are impractical.

I. Provide solenoid valves upright in horizontal lines only, unless their design allows installation in vertical pipe.

J. Where compressor(s) do not have pump down control and the compressor(s) associated evaporator coil(s) do not have bottom suction header connections and the evaporator coil(s) are located above the compressor(s), then loop suction lines(s) to top level of coil to prevent liquid slugging.

K. To prevent erratic operation of thermal expansion valve, provide a suction line trap next to evaporator coil suction outlet with expansion valve bulb located between coil and trap. Provide only in suction lines which are level leaving coil outlet or which rise on leaving coil outlet. Trap not required when evaporator coil outlet suction line drops to compressor or suction header immediately after expansion valve bulb.

END OF SECTION 23 23 13

SECTION 23 31 00
DUCTWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide complete duct systems as indicated. Systems shall include, but not be limited to, the following: outside air, exhaust air, and air conditioning supply and return air duct systems as shown on drawings. Drawing scales prohibit the indication of all offsets, fittings, and like items; however, these items shall be installed as required for the actual project conditions at no change in contract price.

B. Items Included: This section generally includes, but is not limited to, the following major items:

1. Low pressure sheet metal ductwork.
2. Acoustical thermal duct liner.
3. Low pressure flexible ducts.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions" for related requirements. Refer to other sections of Division 23 and to other applicable portions of the Drawings and Specifications.

B. This section is directly related in particular to sections (which may or may not be included in this division) which describe the following:

1. Sections describing air handling equipment and fans.
2. Air distribution devices.
3. Terminal units.
4. Duct system accessories.
5. Insulation.

C. Coordinate shop drawings, ordering, delivery, and placement of all items affecting the duct systems including, but not limited to, the following items: air handling units, exhaust fans, supply fans, sound attenuators, duct mounted coils, access panels, air distribution devices, fire dampers, outside air louvers, hoods, filters, roof curbs, structural framing, roof construction, roofing, and the work of all trades to insure an orderly and timely progression of the work. Refer to the requirements of Section entitled "General Mechanical Provisions".

D. Refer to other sections which may describe additional sound attenuation measures which may relate to this section.

1.4 SHOP DRAWINGS

A. Refer to Section entitled "General Mechanical Provisions". Include complete data as applicable to this project on: all prefabricated duct and fittings; duct liner including mechanical fasteners and adhesives; duct sealing materials; duct joining and seaming

methods; and all other items. If required by Architect, prepare and submit for approval completely detailed shop drawings of supply and return ductwork from any or each air handling unit through its transitions, bends and elbows until such ducts are extended beyond the air handling unit equipment area and/or congested areas; these shop drawings will not be required unless specifically called for elsewhere or unless significant deviation from the Drawings is necessitated by the equipment provided.

1.5 OTHER REQUIREMENTS

A. Provide all ductwork and components thereof in accord with manufacturer's recommendations. All ductwork dimensions indicated are nominal free clearance internal dimensions which do not include insulation thickness.

1.6 DEFINITIONS

A. "SMACNA" means "Sheet Metal and Air Conditioning Contractors National Association, Inc."

B. Low Pressure Ductwork: Any and all ductwork conveying air or other gases at velocities less than 2500 fpm and static pressure less than 2.0 inches wg. This ductwork may also be referred to in these specifications as "Low Velocity Ductwork". SMACNA "HVAC Duct Construction Standards, Metal and Flexible", Second Edition, 1995, shall govern construction of this ductwork unless otherwise specified.

1. Where and if fiberglass ductwork is specified, it shall be considered only for low pressure classification use and shall be constructed in accord with SMACNA "Fiberous Glass Duct Construction Standards", Fifth Edition, 1977.

C. High Pressure Ductwork: Any and all ductwork conveying air or other gases at velocities equal to or greater than 2500 fpm or static pressure equal to or greater than 2.0 inches wg. This ductwork may also be referred to in these specifications as "High Velocity Ductwork" or "Medium Pressure Ductwork", but shall be considered, in either terminology, to fall within pressure/velocity class (PV/C designation) 3 to 10. SMACNA "HVAC Duct Construction Standards, Metal and Flexible", Second Edition, 1995, shall govern construction of this ductwork unless otherwise specified.

1.7 PRESSURE/VELOCITY CLASSIFICATIONS

A. Pressure and velocity classifications (hereinafter called "P/VC") for ducts are defined as follows:

P/VC Desig.	SMACNA Pressure Class	Static Pressure Rating	Positive or Negative Pressure	SMACNA Seal Class	Maximum Velocity (fpm)
10	High	10"	+	A	2000 up
6	Medium	6"	+	A	2000 up
4	Medium	4"	+	A	4000 dn
3	Medium	3"	+ or -	B	4000 dn
2	Low	2"	+ or -	C	2500 dn
1	Low	1"	+ or -	C	2500 dn
½	Low	1/2"	+ or -	C	2000 dn

B. See Part 3, EXECUTION, of this section for duct sealing requirements.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials shall comply with current SMACNA standards.

B. ASTM: Unless otherwise specified, ASTM material specifications applicable are:

Material	Type	ASTM Number
Galvanized steel	G90	A525
Stainless steel	304,316	A240
Cold rolled steel	20-28 ga.	A366
Cold rolled steel	18 ga.	A619
Aluminum	3003 H-14	B609

C. Special Materials, Gauges and Construction:

1. Special Materials: Where special duct material other than galvanized steel is required, such duct material (e.g., fiberglass, stainless steel, plastic such as polyvinylchloride, etc.) shall be specifically indicated.
2. Gauges: Gauges indicated in this section are for galvanized steel. Where greater or lesser gauges are specifically indicated for a sheet metal material other than galvanized steel, provide the indicated gauge. Comply with the SMACNA construction standard covering the required material if no gauge is given.
3. Construction: Comply with indicated special requirements (i.e., such as welding, soldering, etc.) where application requires.

2.2 LOW PRESSURE SHEET METAL DUCTWORK

A. Material: Prime quality forty-eight inch wide resquare tight coat galvanized steel conforming to the requirements of ASTM A-525 and/or A-527 as applicable to the intended use.

B. Construction:

1. Construct to comply with the pressure/velocity classification(s) indicated.
2. Use rectangular or round as indicated on drawings.
3. Reinforcing, Cross Breaking, Seams, Joints: Be in accord with latest SMACNA construction standard for low pressure sheet metal duct.
4. Gauge: As required by SMACNA for the dimensions and pressure/velocity classification involved.

C. Insulation:

1. Rectangular rigid sheet metal ductwork: shall be internally lined with acoustical thermal duct liner if so designated.
2. Round rigid sheet metal ductwork: Where low pressure round ductwork is designated to have internal acoustical/thermal liner, provide factory fabricated double wall ductwork as specified for high pressure round acoustically lined sound attenuating duct (i.e., factory fabricated double wall duct with perforated inner wall).

2.3 ACOUSTICAL THERMAL DUCT LINER

A. Line ductwork where indicated. Dimensions indicated are net inside dimensions. Liner shall be one inch thick, three pound density fiberglass duct liner with the surface in contact with moving air stream stabilized with black pigmented neoprene. Duct liner shall comply with

requirements of NFPA 90A as to flame spread and smoke developed ratings. Duct liner shall be factory treated with antimicrobial/antibacterial treatment to prevent formation & growth of bacteria.

B. Acceptable Manufacturers: Johns-Manville, Microtex; PPG Industries, Testrafine; or Certain-Teed/Saint Gobain, Coated Ultralite.

C. Attachment: Attach to the interior of sheet metal ducts using a full coverage coat of Foster's 85-20 adhesive and mechanical fasteners applied as follows:

1. Horizontal Ducts: Install mechanical fasteners on underside of the tops of ducts over twelve inches in width and on the insides of ducts over sixteen inches in height.
2. Vertical Ducts: Install mechanical fasteners on all duct surfaces exceeding twelve inches.
3. Fastener Spacing: Install fasteners within two inches of the leading edge of each duct section and within three inches of the leading edge of cross joints in insulation within any given duct section. Pins shall thereafter be spaced at not more than fifteen inches on centers. Pins shall be installed in strict accordance with manufacturer's instructions.

D. Edge Stabilization: All exposed edges and the leading edge of all cross joints of liner shall be coated with Foster's 30-36.

2.4 LOW PRESSURE FIBERGLASS DUCTWORK

A. Material: One and one-half inch (1-1/2") thick glass fiber ductboard, meeting requirements of NFPA 90A and shall have a factory applied UL 181, Class 1 air duct listing label. Board shall be faced with aluminum foil. Inside surface shall be factory treated for microbial bacterial growth prevention.

1. Fabricated from or lined with non-corrosive, non-hydroscopic, permanently odorless, resilient, long staple, fabric grade glass fibers preformed into semi-rigid or rigid board.
2. Flexural rigidity rating of 800EI per ASTM test number D 1037 64 where neither width nor depth or duct exceeds 48 inches.
3. Flexural rigidity rating of 1400EI per ASTM test number D 1037 64 where width or depth exceeds or equals 48 inches.
4. Non-erosive when conveying air at velocities equal to or less than 2000 fpm.
5. Approved, fire retardant, moisture sealing, factory-applied jacket made of kraft paper and 2 mil minimum thickness aluminum foil.
6. Maximum thermal conductivity of 0.23 at 75°F mean temperature.

B. Fabrication: Ductwork fabrication shall be in accordance with SMACNA Fibrous Glass Manual, Duct Construction Standards, and current manufacturer's literature on approved fabrication methods.

C. Closure Systems: Closure systems shall be as specified by manufacturer of the ductboard to maintain the UL Class 1 duct label. Provide closure of all joints using 9/16" outward clinch staples, approximately two inches (2") wide pressure sensitive tape. Use factory molded male-female joints wherever possible. Use appropriate UL and SMACNA approved tapes.

D. Acceptable Products: Johns-Manville Micro-Aire Type 475 or 800 as applicable; Owens Corning Fiberglass Type 800FR or 1400FR as applicable; or approved equal.

2.5 LOW PRESSURE FLEXIBLE DUCTS

A. General:

1. The inclusion of flexible ducts in this specification shall not be construed as approval of use on the project unless specifically shown on the Drawings.
2. Where used, provide in factory finished lengths not in excess of lengths required to make kink-free connections with minimum air pressure drop.

B. Insulated flexible ducts: Flexible duct shall be factory-fabricated preinsulated type with seamless vapor barrier. Duct shall bear UL 181 Class 1 Air Duct label and shall comply with NFPA 90A and 90B. Fiberglass insulation nominal 1" thickness with thermal conductance of 0.23 BTU/hr-ft2-^{o}F maximum at 75°F mean temperature. Flexible duct shall have an operating range of minus 0.5" w.g. to plus 2" w.g. Core shall be continuous and consist of aluminized mylar laminated to corrosion resistant steel wire helix. Vapor barrier perm rating shall be 0.17 maximum per ASTM E96-A. Maximum working velocity shall be 4000 FPM. Flexible duct shall be Genflex SLR-25, Clevaflex Type KQ, Wire Mold type WG, Flexmaster Type 5B, or approved equal.

C. Un-insulated flexible ducts, steel: Flexible ductwork shall be constructed of all metal one ply hot-dipped galvanized steel, closely corrugated for strength and flexibility, with seams interlocked, folded flat, and knurled to insure tightness. Duct shall be listed as #UL181 "Flexible Air Duct", Class 1, and NFPA 90A. Products shall be Flexmaster Type NI-TL, Clevaform Type GS or approved equal.

D. Round branch take-off fittings for flexible duct:

1. Round duct branch take-off fitting shall be made of galvanized sheet metal designed for twist-in installation and to assure minimum air loss at the take-off. The fittings shall be of the conical converging type to reduce the pressure drop through the fittings. Provide a raised bead on the throat of the fitting to assure a tight positive connection. Products shall be Flexmaster Model CB-DE-BO3 or approved equal.
2. Provide each fitting with the following:

   a. Lockable quadrant damper.
   b. 45-degree extractor scoop.
   c. Insulation guard where used with internally lined ductwork.

3. Provide these "spin-in" type fittings at all connections between rigid sheet metal duct and flexible duct at the upstream end of the flexible duct.

PART 3 - EXECUTION

3.1 GENERAL

A. All duct systems shall be free of noise, chatter, vibration and pulsation under all conditions of operation. Remove, replace or reinforce as directed by the Architect/Engineer if necessary to correct such conditions.

B. If field conditions are determined to exist which would limit the guarantee of air delivery or system performance, due notice in writing shall be submitted to the Architect/Engineer of such conditions prior to starting fabrication.

C. Properly support and align ductwork. Ducts to be free of sag and bulge. Hang ductwork below concrete floors or roof deck with hangers set prior to pouring concrete, or from self drilling screw anchors. GUN POWDER SET ANCHORS ARE NOT PERMITTED.

D. Where it is necessary that ducts be divided due to pipes or other obstructions which must pass through these ducts, the Contractor shall, at locations as noted or directed, provide air-stream deflectors in the duct and the duct shall be increased in size to maintain equivalent area around deflectors. Such changes shall be in accord with standard SMACNA details and shall be shown on Contractor's As-Built Drawings.

E. Interior of ductwork visible through registers, grilles, or diffusers shall be painted flat black.

F. Do not route ductwork through transformer vaults and electrical equipment spaces and enclosures.

G. Construct all ductwork and accessories in accord with the latest indicated editions of applicable SMACNA construction standards. Sheet Metal and Air Conditioning Contractors' National Association.

H. Streamline all ductwork to the full extent practical and equip with proper and adequate devices to assure proper balance and quiet draftless distribution of indicated air quantities.

I. Protect all ductwork and system accessories from damage during construction until Architect/Engineer's final acceptance of project.

J. Prior to ductwork fabrication, verify if all ductwork as dimensioned and generally shown will satisfactorily fit allocated spaces. Take precautions to avoid space interferences with beams, columns, joists, pipes, lights, conduit, other ducts, equipment, etc. Notify Architect/Engineer if any spatial conflicts exist, and then obtain Architect/Engineer's approval of necessary routing. Make any such necessary revisions which are minor at no additional cost.

K. Carefully correlate all duct connections to air handling units and fans to provide proper connections, elbows and bends which minimize noise and pressure drop.

L. Provide all curved elbows with radius ratios of not less than 1.5 unless otherwise shown or approved by Architect/Engineer. Provide all mitered elbows with turning vanes.

M. Properly suspend all ductwork so that no objectionable conditions result (such as vibration, sagging, etc.).

N. Coordinate any and all dimensions at interfaces of dissimilar type of ductwork and at interfaces of ductwork with equipment so that proper overlaps, interfaces, etc., of insulation and continuity of vapor barriers are maintained.

O. If necessary where ducts interface and have different types of insulation, provide transitions so that internal free-clear dimensions of duct remain unchanged.

P. Install horizontal low pressure ductwork at a level which maximizes length of any vertical, rectangular or round rigid duct connections to rectangular diffuser necks; however, such vertical duct connections are not required to be over 24 inches in length.

Q. Make connections from any low pressure ductwork to terminal units (fan terminal units, variable volume boxes, etc.) with appropriate lengths of flexible duct unless other type of connection is indicated.

R. Install all flexible round duct without kinks or similar obstructions so that pressure drop is minimized. Cut and remove excess lengths as necessary.

S. Install horizontal rigid ductwork as high as practical above suspended ceilings so that movable light fixtures may be relocated without interference to meet any future partition relocation requirements.

T. Insulated Duct: Where ducts will be insulated, make provision for neat insulation finish around damper operating quadrants, splitter adjusting clamps, access doors, and similar operating devices. A metal collar equivalent in depth to insulation thickness and of suitable size to which insulation may be finished shall be mounted on duct.

3.2 LOW PRESSURE SHEET METAL DUCTS

A. If width or height of rectangular duct exceeds 12 inches, cross break or roll a cross bead in panels to increase stiffness; otherwise, use two gages heavier steel.

B. Provide corner closures. Longitudinal seams and transverse joints shall be flat and smooth inside. Make slip joints in direction of air flow. See governing SMACNA manual for transition requirements.

C. Fabricate offsets, turns and elbows with centerline radius equal to 1-1/2 times diameter when possible. No mitered offsets will be allowed. Provide double thickness turning vanes to assist in smooth flow of air in square elbows or elbows with centerline radius less than duct width or diameter.

3.3 LOW PRESSURE FLEXIBLE DUCTS

A. Flexible ducts shall not be used unless specifically indicated on drawings.

B. If flexible duct is indicated for use on this project, it must comply with the following requirements.

1. The extent of the use of flexible ductwork shall be limited to that shown on the drawings.
2. Flexible duct installation shall be per SMACNA Flexible Duct Installation Standards, and manufacturers latest printed instructions, whichever is stricter. In addition the following shall apply:

    a. Flexible duct between rigid duct and diffusers shall be a MAXIMUM of 8 feet in length and shall be fully extended with a maximum equivalent of (2) 90 degree bends (no bend shall be made with centerline radius of less than one duct diameter). No additional flexible duct shall be provided for future terminal device relocation unless otherwise specified.
    b. Flexible duct shall be supported at ends and at each 90 degree bend. Maximum permissible sag is 1/2 inch per foot of spacing between supports.
    c. Hanger or saddle material in contact with the flexible duct shall be of sufficient width to prevent any restriction of the internal diameter of the duct when the weight of the supported section rests on the hanger or saddle material. In no case will the material contacting the flexible duct be less than 1 inch wide. Narrower hanger material may be used in conjunction with a sheet metal saddle which meets the foregoing specifications. This saddle must be formed to cover one-half the circumference of the outside diameter of the flexible duct and must be rolled to fit neatly around the lower half of the duct's outer circumference.

d. Factory installed suspension systems integral to the flexible duct are an acceptable alternative hanging method when manufacturers recommended procedures are followed.
e. Hangers shall be adequately attached to the building structure (not pipe, conduit, etc.).
f. To prevent tearing of vapor barrier, do not support entire weight of flexible duct on any one hanger during installation. Avoid contact of flexible duct with sharp edges of hanger material. Damage to vapor barrier may be repaired with approved tape. If internal core is penetrated, replace flexible duct or treat as a connection.

3. Terminal devices connected by flexible duct shall be supported independently of the flexible duct.

3.4 OTHER SPECIAL DUCT SYSTEMS

A. Roof Mounted Exterior Ductwork:

1. Support all roof-mounted exterior ductwork with angle iron bracing firmly secured to roof construction and in such a manner to maintain watertight integrity of specified roofing system. All ductwork roof penetrations and ductwork support roof penetrations shall also be provided in such a manner to maintain watertight integrity of specified roofing system.
2. All roof-mounted exterior ductwork shall be completely and permanently weatherproof including connections at air conditioning units, roof penetration points and all other points.
3. Submit shop drawings completely describing all supporting systems for this external ductwork.

B. Perchloric Acid Fume Hood Exhaust Ductwork and Wash-Down System:

1. The fume hood manufacturer shall fabricate and install all perchloric acid fume hood exhaust ductwork, including exhaust fans and stacks. The ductwork shall be routed as shown on the drawings, shall be fabricated and installed by the mechanical contractor.
2. The fume hood manufacturer shall design, fabricate and install all perchloric acid fume hood exhaust washdown and drain systems. The respective washdown water supply and drain piping systems shall be connected to domestic water supply and drain connections provided at the locations shown on the plumbing drawings.

3.5 MISCELLANEOUS DUCT SYSTEM COMPONENTS

A. Spin-In Take-Off Fittings: Install around duct branch takeoff fittings according to manufacturer's installation instruction. Additionally seal fitting to rectangular duct with a thin bead of mastic sealant.

3.6 HANGERS AND SUPPORTS

A. General: Comply with latest applicable SMACNA construction standard. Where sprayed fireproofing occurs, install hangers before application of such treatment and withhold installation of ducts until after application.

B. Supports: Vertical risers and other duct runs where the method of support specified above is not applicable shall be supported by substantial angle brackets designed to meet field conditions and installed to allow for duct expansion.

C. Fasteners: Secure hangers to steel beams or metal deck with beam clamps or drop through connections from the metal or concrete deck.

3.7 CHANGES IN SHAPE OR DIMENSION

A. Where duct size or shape is changed to effect a change in area, the following shall apply:

1. Where the area at the end of the transformation results in an increase in area over that at the beginning, the slope of the transformation shall not exceed one inch in seven inches.
2. Where the area at the end of the transformation results in a decrease in area from that at the beginning, the slope of the transformation may be one inch in four inches, but one inch in seven inches is preferable, space permitting.
3. The angle of transformation at connections to heating coils or other equipment shall not exceed thirty degrees from a line parallel to the air flow on the entering side of the equipment, nor fifteen degrees on the leaving side. The angle of approach may be increased to suit limited space conditions when the transformation is provided with vanes approved by the Architect/Engineer.

3.8 CHANGES IN DIRECTION

A. Changes in direction shall be basically as indicated on the drawings and the following shall apply:

1. Supply duct turns of ninety degrees in low pressure duct shall be made with mitered elbows fitted with closely spaced turning vanes designed for maintaining a constant velocity through the elbow.
2. Return and exhaust duct turns of ninety degrees in low pressure duct shall be made with mitered elbows, as specified hereinbefore for supply ducts, unless radius elbows are indicated in which case they shall be constructed with a turning radius one and one-half (1-1/2) times the width (with width considered as the dimension in the plane of the turn) as measured to the duct centerline.
3. Tees in low pressure duct shall conform to the design requirements specified hereinbefore for elbows.
4. Branch take-offs in low pressure supply duct shall be made with extractors or splitter dampers, as indicated, in square take-offs.
5. In high pressure duct, branch take-offs and connections to flexible duct supplying air to terminal units shall be made with conical taps.

3.9 IMPROPER MATERIALS OR CONFIGURATION

A. If ductwork materials or ductwork configurations are installed which do not meet these specifications, Contractor shall remove such ductwork and replace with materials or configurations which are acceptable. Any delay in job progress will be the responsibility of the Contractor.

3.10 OTHER REQUIREMENTS

A. Insulated Duct: Where ducts will be insulated, make provision for neat insulation finish around damper operating quadrants, splitter adjusting clamps, access doors, and similar operating devices. A metal collar equivalent in depth to insulation thickness and of suitable size to which insulation may be finished shall be mounted on duct.

B. Control Devices: Properly install all control related devices which are part of the duct systems. See Section(s) describing control systems.

3.11 SEALING OF DUCTS

A. Duct seal classes are as follows:

1. Seal class "A": Seal all transverse joints, longitudinal seams and duct wall penetrations. Use for P/VC-4 (4" w.g.) and greater unless otherwise indicated.
2. Seal class "B": Seal all transverse joints and longitudinal seams. Use for P/VC-3 (3" w.g.) unless otherwise indicated.
3. Seal class "C": Seal all transverse joints. Use for P/VC-2 (2" w.g.) and lower unless otherwise indicated.

B. Where sealing is required it shall mean the following:

1. The use of adhesives, gaskets, tape systems or combinations thereof to close openings in the surface of the ductwork and field-erected plenums and casings through which air leakage would occur; or
2. The use of continuous welds;
3. The prudent selection and application of sealing methods by fabricators and installers, giving due consideration to the designated pressure class, pressure mode (positive or negative), chemical compatibility of the closure system, potential movement of mating parts, workmanship, amount and type of handling; cleanliness of surfaces, product shelf life, curing time and manufacturer-identified exposure limitations;
4. That these provisions are applicable to duct connections to equipment and to apparatus but are not for equipment and apparatus;
5. That where distinctions between seams and joints are made herein, a seam is defined as joining of two longitudinally (in the direction of air-flow) oriented edges of duct surface material occurring between two joints. Helical (spiral) lock seams are exempt from sealant requirements. All other duct surface connections made on the perimeter are deemed to be joints. Joints are inclusive of but not limited to girth joints; branch and sub-branch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum and casing abutments to building structures; that sealing requirements herein do not contain provisions to:

    a. Resist chemical attack.
    b. Be dielectrically isolated.
    c. Be waterproof, weatherproof or ultraviolet ray resistant.
    d. Withstand temperatures higher than 120°F or lower than 40°F.
    e. Contain atomic radiation or serve in other safety-related construction.
    f. Be electrically grounded.
    g. Maintain leakage integrity at pressures in excess of the duct classification herein.
    h. Be underground below the water table.
    i. Be submerged in liquid.
    j. Withstand continuous vibration visible to the naked eye.
    k. Be totally leak-free within an encapsulating vapor barrier.
    l. Create closure in portions of the building structure used as ducts, e.g., ceiling plenums, shafts, pressurized compartments.

6. The requirements to seal apply to both positive pressure and negative pressure of operation.
7. Externally insulated ducts located outside of buildings shall be sealed prior to being insulated as though they were inside. If metal surfaces of ducts located on the exterior of buildings are exposed to weather, they shall receive exterior duct sealant. An exterior duct sealant is defined as a sealant that is marketed specifically as forming a positive air and water tight seal, bonding well to the metal involved, remaining flexible with metal movement and having a service temperature range of -30°F to 175°F. If exposed to direct sunlight it shall also be ultraviolet ray and ozone resistant or shall, after curing, be painted with a compatible coating that provides such resistance. The term sealant herein

is not limited to materials of adhesive or mastic nature but is inclusive of tapes and combinations of open weave fabric strips and mastics.

C. Materials and applications for sealing ducts:

1. General:

a. Complete product data on all materials used for sealing ducts must be submitted for approval prior to any duct fabrication.
b. All sealants must be specifically recommended by their manufacturer for the purpose of sealing ducts.

2. Liquid Sealant:

a. Use only for slip type joints where sealant is to fill small space between overlapping pieces of metal. Do not use where metal clearances exceed 1/32-inch.
b. Sealant must be specifically manufactured for the purpose of sealing ducts.

3. Mastics:

a. Use in lieu of liquid sealant at Contractor's option.
b. Use as a fillet, in grooves and between flanges.
c. Do not use oil base caulking or glazing compounds.

4. Gaskets:

a. Use soft elastomer butyl or neoprene rubber or extruded forms of sealants in flanged joints in addition to mastic.

5. Tape:

a. Tape is not allowed on sheet metal ducts.

6. Combination of mastic and embedded fabric:

a. Use mastic/mesh/mastic as a sealant where pressure/velocity classification equals and exceeds P/VC-3 and where any spaces between metal surfaces at transverse joints or longitudinal seams or duct wall penetrations exceeds 1/16-inch.
b. Apply glove coat of mastic, then embed a continuous or overlapping strip of not less than 4-inch wide 10 x 10 fiberglass cloth into the mastic, then apply a final glove coat of mastic over the glass cloth.

7. Surface preparation:

a. Surfaces to receive sealant should be adequately clean (free from oil, dust, dirt, rust, moisture, ice crystals and other substances that inhibit or prevent bonding). Use solvent and/or apply a face primer if necessary to obtain adequately clean surface for adhesion.

3.12 LEAKAGE TESTING

A. General:

1. Test the following duct systems:

a. All ducts which are (1) under positive or negative pressure and (2) which are directly connected to air moving device (air handling unit, exhaust fan, supply fan or similar air moving equipment) and (3) which convey 1000-cfm or greater through their largest portion.
b. All ducts which are (1) under positive or negative pressure and (2) which are part of a supply, return, outside and/or exhaust air system and (3) which are equal to or greater than 25 feet in length and (4) which may or may not be directly connected to an air moving device.

2. Portions of duct to be tested shall consist of all portions from the largest cross sectional area to the air distribution device connection or to the smallest inlet or outlet point, whichever is applicable.
3. Duct systems shall be constructed so that leakage does not exceed 5.00% of the air quantity handled by the respective fan.

B. Allowable Leakage:

1. Leakage shall be measured during leakage test at a test pressure which is equal to the pressure/velocity classification of the duct system (e.g., a P/VC-2 duct shall be tested at 2.0 in. w.g.s.p., a P/VC-1/2 duct at 0.5 in. w.g.s.p., etc.).

C. Test Procedure:

1. Test at time of duct installation and prior to installation of any field applied insulation and prior to any concealment in chases or similar enclosures.
2. Duct openings (both entry openings and outlet openings) shall be capped or sealed by taping or banding a flexible plastic sheet over each opening prior to pressurizing duct. The plastic sheet shall be of adequate strength and thickness to withstand the test pressures. Use other method of sealing duct openings providing objective of test is obtained and if method of sealing is approved by Architect/Engineer.
3. Use a fan having a minimum capacity of 300-cfm or 5% of the particular duct system design capacity, whichever is greater and which is capable of producing a duct test pressure of 150% of the duct test pressure.
4. Test fan shall be connected to a flow measuring assembly consisting of straightening vanes and an orifice plate mounted in a straight tube with appropriately located pressure taps. Orifice assembly shall be accurately calibrated with its own calibration curve. Pressures shall be measured with U-tube manometers and corresponding flow rates obtained from the orifice performance curve.
5. Connect test fan and orifice flow measuring assembly to the duct to be tested with a section of flexible duct.
6. Test for audible leaks as follows:

a. Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
b. Start the blower with its control damper closed (some small blowers popularly used for testing ducts may damage the duct because they can develop pressures up to 25 inches (W.G.).
c. Gradually open the inlet damper until the duct pressure reaches 50% in excess of designed duct operating pressure.
d. Survey all joints for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealing has been repaired if and where necessary.

7. After all audible leaks have been sealed, the leakage should be measured with the orifice section of the test apparatus as follows:

a. Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.
b. Total allowable leakage shall not exceed five (5) percent of the total system design air flow rate. When partial sections (such as supply section, return section, etc.) of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.

8. Correct any duct leaks which are detected either audibly or by touch regardless of whether leakage through duct system is less than allowable test leakage.

3.13 DEFINITIONS OF DUCT TYPES

A. Refer to the "Duct Type and Location Schedule" on the Drawings for:

1. The type of ductwork and where it is to be installed.
2. The pressure/velocity class at each location.
3. Indication of whether the ductwork is to be insulated externally or internally lined or not insulated.

END OF SECTION 23 31 00

SECTION 23 33 00
DUCT SYSTEM ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide all necessary duct system accessories to assure proper balance, quiet and draftless distribution and conveyance, and minimization of turbulence, noise and pressure drop for all supply return, exhaust and ventilation air quantities indicated.

B. Items Included: This section generally includes, but is not limited to, the following items as may be applicable to this project:

1. Flexible duct connections.
2. Splitters.
3. Turning vanes.
4. Manual volume dampers.
5. Access doors.
6. Fire Dampers.
7. Smoke Dampers.
8. Fire/Smoke Dampers.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:

1. Ductwork.
2. Air distribution devices.
3. All types of air handling equipment.

1.4 COORDINATION

A. Coordinate all items affecting the duct systems including but not limited to the following items: air handling units, exhaust fans, supply fans, sound attenuators, duct mounted coils, access panels air distribution devices, fire dampers, outside air louvers, hoods, filters, roof curbs, structural framing, roof construction, roofing, and the work of all trades to insure an orderly and timely progression of the work.

1.5 SHOP DRAWINGS

A. Include complete data on: access doors; flexible connectors; manual volume dampers including operating hardware; turning vanes; automatic shutters and all other items.

B. See section entitled, "General Mechanical Provisions".

1.6 OTHER REQUIREMENTS

A. Provide all components in accordance with manufacturer's recommendations.

B. All ductwork dimensions indicated which may affect items of this section are nominal free clearance internal dimensions which do not include insulation thickness.

1.7 DEFINITIONS

A. "SMACNA" means "Sheet Metal and Air Conditioning Contractors National Association, Inc.".

PART 2 - PRODUCTS

2.1 GENERAL

A. Be recommended by the manufacturer for the application.

B. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:

1. Ventfabrics
2. Barber-Colman
3. Tuttle & Bailey
4. Dura-Dyne
5. Airsan
6. Titus
7. Anemostat
8. Young
9. Metalaire
10. United McGill

C. Products which are specified may not necessarily all be required on the projects; provide those products which are applicable.

2.2 FLEXIBLE DUCT CONNECTIONS

A. Provided where air handlers, fans and blowers connect to their ductwork.

B. At least 4 inches long.

C. Connected on each side to metal (either metal ductwork, air handling apparatus, or heavy gauge steel sleeves).

D. For use in high and/or low pressure duct systems.

E. Ventfabrics, Inc., "Ventglas Metaledge", or equivalent.

2.3 SPLITTERS

A. Provide for adjustment of air volume to their respective branches, where indicated. Constructed of at least the same gauge galvanized steel as the duct wherein they are used, and in no instance be less than twenty-two (22) US gauge. Use in low pressure duct systems only. Be adequately sized to close off air to applicable branches. Rigidly attached to pivot

rod and operating linkage. Install on raised insulated base when used in internally insulated ductwork. Splitter blades; formed in two thicknesses of metal so that entering edge presents rounded nose to air flow; length no less than one and one half times the width of the smaller branch served or twelve inches, whichever is larger. Hardware used for the construction, assembly, and operation of splitter dampers shall be as follows:

1. Operators for exposed splitters and those located above "lay-in" or accessible ceiling shall be Ventlok #690 splitter damper assembly.
2. Operators for concealed splitters shall be Ventlok #691 with #680 miter and #677 concealed regulator.

2.4 LOW PRESSURE METAL TURNING VANES

A. Provide in all elbows, bends and tees of all low velocity supply air ducts whether or not shown in detail; provide in all elbows, bends and tees of all other low velocity ducts where portions of such ducts convey air at greater than 700 fpm average velocity. Adequate rigidity and strength to be completely flutterproof; properly designed; permanently fixed type. Aluminum, or steel with acid/solvent chemical corrosion resistant coating, or galvanized steel. Air foil type in all mitered elbows, mitered bends and tees. Air foil type must be manufactured by Titus, Tuttle & Bailey, Anemostat, Waterloo, Metalaire, Barber-Colman or other approved manufacturer. Be Barber-Colman "Airturns", Tuttle and Bailey "Ducturns", or Dura-Dyne "VR" with 24 gauge rails and hollow vanes, or equivalent.

2.5 HIGH PRESSURE TURNING VANES

A. None required for this project.

2.6 MANUAL VOLUME DAMPERS

A. These dampers are to be other than those specified as being integral with each register, diffuser and other air outlet or inlet.

B. Provided where indicated in the complete air distribution system(s) (including ductwork, return air plenums, etc.) to allow complete balancing of the air supply, return, ventilation and exhaust system(s).

C. Opposed blade type.

D. 8" maximum blade width.

E. Made of galvanized steel, steel with acid/solvent chemical resistant coating, or steel with a sprayed or dipped aluminum rust resistant finish; flutterproof.

F. Provided so that all damper adjustment can be made from outside the completed ductwork without necessity for puncturing or otherwise penetrating the ductwork and/or its vapor barrier.

G. Fully adjustable and with locking device.

H. Manufactured by Titus, Tuttle & Bailey, Anemostat, Waterloo, Metalaire, Greenheck or equivalent.

I. Provided at a point in the ductwork which is a sufficient distance upstream from an outlet (or downstream from an inlet) to attenuate objectionable noise due to damper throttling and to preclude adverse effects on the distribution device.

J. Based upon location of the duct in which the damper is to be installed, provide the following types:

1. Dampers in ducts which are exposed or located above "lay-in" or "accessible ceilings": Young Regulator Company Model 817 or equivalent.
2. Dampers in ducts concealed above plaster ceilings or behind dry wall construction: Young Regulator Company Model 817A or equivalent.

K. Use in low pressure duct system only.

2.7 LOW PRESSURE DUCT ACCESS DOORS

A. Provided for: each manual and motorized damper; fire damper; smoke damper; electric duct heater; and where access is otherwise necessary.

B. Factory prefabricated double wall insulated type of 24 US gauge galvanized steel (of same or thicker gauge than ductwork panel in which installed, whichever is greater).

C. Minimum size shall be as large as is compatible with duct size but in no case less than the following (provide larger sizes if necessary to permit proper access operation):

Max. Duct Dimensions	Access Door Size
11" and less	10" x 12"
12" through 16"	12" x 16"
17" and over	16" x 24"

D. Doors shall be provided with and operated adjustable tension catches and shall be completely gasketed around their perimeters. Doors shall be Ventlok "Access Doors". Install in accordance with manufacturers recommendations using Ventlok #360 sealant or equivalent.

2.8 TEST OPENINGS

A. Furnish and install gasketed capped test openings for test equipment (pitot tubes, etc.) on the entering and leaving sides of air handling unit and other air handling equipment and heating coils. Test openings shall be Ventlok #699-2 or equivalent.

2.9 PREFABRICATED DUCT CONNECTIONS

A. At Contractor's option, prefabricated duct connections as manufactured by Ductmate (or approved equal system) may be used in locations and applications for which the duct connection system is recommended. Use of these connections must meet or exceed specified duct construction quality as related to structural rigidity, pressure, accessibility and other such requirements.

2.10 FIRE DAMPERS

A. Rating: 1-1/2 hours (UL approved for installation in 2 hour walls).

B. Construction: Minimum 24 gauge galvanized steel frame suitable for connection to ductwork without transition, minimum 24 gauge galvanized steel curtain type blades located out of the airstream, thickness coordinated with wall construction. Where an active smoke control system exists (refer to Section 23 09 93) the damper shall be capable of closing in an

airstream moving at a minimum of 2000 feet per minute and operating at 4" w.g. pressure (dynamic damper).

C. Sleeves: UL listed minimum gauge galvanized steel with welded construction corners. Rollformed sleeves will not be acceptable unless contractor guarantees in writing to seal voids in sleeve with UL approved sealer to limit air leakage. Length of sleeve shall be coordinated with the wall or floor.

D. Operation: Stainless steel constant force closure spring.

E. Link Setting: 160°F or 165°F.

F. Based on Ruskin Manufacturing Co. IBD2 Style B. (Static Systems).

G. Based on Ruskin Manufacturing Co., DIBD2 Style B. (Active smoke control systems only).

2.11 SMOKE DAMPERS

A. Low and Medium Pressure Ductwork:

1. UL labeled under UL 555S low leakage rated, no more than 10 CFM/SF @ 1" w.g. (UL Class II) after exposure to 1000°F for 1 hour (non-degradable). Classified for both horizontal and vertical mounting.
2. Construction:

    a. Frame 16 galvanized steel.
    b. Damper Blades: 14 gauge true airfoil design constructed of galvanized steel of low leakage non-heat degradable design with friction free silicone rubber edge type for a smoke seal to 450°F incorporated into blade and frame shapes. Blade shall be suitable for installation in systems with a maximum velocity of 4,000 FPM and 8” w.g. pressure at closure.

3. Damper operation by means of an electric actuator 120V AC, 24V AC or signal from smoke detector alarm circuit. Electric motor actuator to be UL listed with damper assembly for power open, spring closed operation with a maximum travel time of 15 seconds. Motor furnished with all connecting linkage and mounting hardware.
4. Damper and actuator shall be provided with a 60 month warranty.
5. Based on Ruskin Manufacturing Co., SD60-II.

2.12 SMOKE/FIRE DAMPERS

A. Low and Medium Pressure Ductwork:

1. UL labeled under the following standards:

    a. UL 555 - 1-1/2 hr. fire endurance.
    b. UL 555S - Low leakage rated, no more than 10 CFM/SF @ 1" w.g. (UL Class II) after exposure to 1000°F for 1 hour (non-degradable).
    c. Classified for both horizontal and vertical mounting.

2. Construction: Single damper designed and rated for combination smoke/fire duty.

    a. Frame: 16 ga. galvanized steel.
    b. Damper Blades: 14 gauge true airfoil design constructed of galvanized steel of low leakage non-heat degradable design with friction free inflatable silicone coated

fiberglass material to maintain smoke leakage rating to a minimum of 450°F and galvanized steel for flame seal to 1900°F. Blade shall be suitable for installation in systems with a maximum velocity of 2,000 FPM and 4” w.g. pressure at closure.

c. Duct sleeve provided by others.

3. Operation:

a. Smoke/fire damper operation by means of an integral resettable and re-useable UL listed electric-ambient temperature link, UL listed releasing device and mechanical lock assembly. Link activated by either electric, 120V AC or 24V AC signal from smoke detector alarm circuit or 350°F duct ambient temperature. Damper shall be capable of being reopened by remote signal when the duct temperature drops to 150°F. Electric motor actuator shall be UL listed with the damper assembly for power open/spring closed operation. Motor actuator shall be factory furnished with all connecting linkage and mounting hardware and shall be factory tested for proper operation.

b. Damper and actuator shall be provided with a 60 month warranty.

4. Based on Ruskin Manufacturing, Co., FSD60-2.

2.13 BACKDRAFT DAMPERS

A. Low Pressure Ductwork:

1. Rating: Up to 1" wg positive or negative.
2. Frame: Minimum 16 gauge (.064") galvanized steel or extruded aluminum.
3. Blades: Minimum 16 gauge (.064") galvanized steel or extruded aluminum parallel blade action, brass bearing, non-ferrous or de-iron pivot pins, gasketed blades.
4. Accessories: Counter balance and weights suitable for assisting or retarding as indicated on the drawings.
5. Based on Ruskin Manufacturing, Co. CBD4.

PART 3 - EXECUTION

3.1 GENERAL

A. Construct and install all accessories in accordance with the latest indicated editions of applicable SMACNA construction standards.

B. Provide all mitered elbows with turning vanes.

C. Install all duct system accessories in accordance with manufacturer’s recommendations.

D. All accessories installed in poly-vinyl-steel ductwork shall have acid/solvent chemical corrosion resistant coating.

E. All manual damper arms shall be tagged with fluorescent colored strip.

3.2 FIRE DAMPERS

A. Fire dampers shall be provided where indicated.

B. Review the architectural drawings to determine the wall construction rating so as to provide the proper rated damper.

C. All fire dampers shall be mounted within a UL approved thickness galvanized steel sleeve permanently affixed to the wall by means of perimeter retaining angles.

D. The fire damper shall be permanently attached to the sleeve. All voids around the sleeve and damper and sleeve and wall shall be properly sealed with fire barrier material, refer to division 07.

E. Ductwork shall be attached to the fire damper by means of a UL approved break away connection.

F. Access doors or access sections shall be provided at all fire damper locations.

3.3 SMOKE DAMPERS

A. Provided where indicated. See combination smoke/fire damper for assemblies in fire rated barriers.

B. Review the architectural drawings to determine the wall construction rating so as to provide the proper rated damper.

C. Provide access doors or access sections at all damper locations.

D. Coordinate the provision of the smoke damper actuator with the automatic temperature control and fire alarm system and ensure adequate space for the mounting of the actuator during installation of the damper and ductwork.

3.4 SMOKE/FIRE DAMPER

A. Provided where indicated. All smoke dampers in fire rated barriers to be combination type.

B. Review the architectural drawings to determine the wall construction rating so as to provide the proper rated damper.

C. All smoke/fire dampers shall be mounted within a UL approved thickness galvanized steel sleeve permanently affixed to the wall by means of perimeter retaining angles.

D. The smoke/fire damper shall be permanently attached to the sleeve. All voids around the sleeve and damper and sleeve and wall shall be properly sealed with fire barrier material, refer to division 07.

E. Ductwork shall be attached to the smoke/fire damper by means of a UL approved break away connection.

F. Access doors or access sections shall be provided at all smoke/fire damper locations.

G. Coordinate the provision of the smoke damper actuator with the Building Control System and assure adequate space for the mounting of the actuator during installation of the smoke/fire damper and ductwork.

3.5 BACKDRAFT DAMPER

A. Securely attach backdraft damper to wall with a suitable sleeve and retaining angles and seal all voids between damper and wall.

B. Adjust damper to open or close under the design conditions.

END OF SECTION 23 33 00

SECTION 23 34 29
FANS: CENTRIFUGAL, CEILING MOUNTED

PART 1 - GENERAL

1.1 SCOPE

A. Provide ceiling mounted light duty centrifugal fans with characteristics indicated.

1.2 SHOP DRAWINGS

A. Refer to requirements of Section entitled "General Mechanical Provisions".

1.3 CERTIFIED PERFORMANCE

A. Be AMCA certified as to both sound and performance ratings.

1.4 MANUFACTURER

A. Design Basis: Basis of design is similar to Acme Master-ette Model V Series and Greenheck CSP Series or as scheduled on drawings.

B. Acceptable Manufacturers: Greenheck Fan and Ventilator Corporation; Ilg Industries, Inc.; Powerline, Inc.; Power Ventilator Company, Loren Cook Company; Acme Engineering and Manufacturing Corporation; Penn Ventilator Company, Captive Aire or equal.

PART 2 - PRODUCTS

2.1 FAN HOUSING

A. Fan housing including longitudinal, traverse, and diagonal stiffeners, motor mounts, bearing and drive supports shall be constructed of steel. Entire fan housing shall be internally lined with ½-inch thick or greater, three pound per cubic foot density fiberglass acoustical duct liner with a stabilized surface. Liner shall be held in place with adhesive and mechanical fasteners. All insulation and adhesives shall meet requirements of NFPA 90A as to flame spread and smoke developed ratings. Housing, including all bracing, stiffeners and motor mounted assembly shall be factory finished with a baked on alkyd enamel finish over a corrosion resistant primer. Removable panel in bottom of housing for complete access to motor and fan.

2.2 CEILING INLET GRILLE

A. Steel or aluminum: Baked enamel finish.

2.3 FAN WHEEL

A. Shall be centrifugal type and shall be statically and dynamically balanced. Single or twin impeller as necessary to provide indicated performance.

2.4 FAN MOTOR

A. Permanently lubricated shaded pole motor mounted on resilient isolators to minimize vibration and noise.

2.5 BACK DAMPER

A. Mounted in throat of fan discharge.

2.6 DRIVE ASSEMBLY

A. Drive shall be direct drive type as indicated on drawings, and shall conform with the requirements of Section entitled "General Mechanical Provisions".

2.7 DISCONNECT SWITCH

A. Fans shall include factory mounted disconnect switches prewired to the drive motor.

2.8 SPEED CONTROL

A. Solid state speed controller for speed reduction to 40% Mounted on housing or as otherwise indicated.

PART 3 - EXECUTION

3.1 PLACEMENT AND MOUNTING

A. Fan locations shall be essentially as shown on drawings; however, actual fan placement shall be verified using field measurements and data relating to equipment approved for actual installation on this project. Mount fan in strict accordance with manufacturer's instructions.

3.2 TEST AND BALANCE

A. All fan performance shall be certified by test and balance procedures as specified in section describing test and balance procedures.

END OF SECTION 23 34 29

SECTION 23 37 13
AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide all air distribution devices as indicated on the drawings and as specified herein for a complete and operable system.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

B. Coordinate with work of the ceiling, drywall and plastering trades as required to insure an orderly progression of work and a first class finished system with respect to placement, alignment, finish, general fit and absence of conflict with lighting systems and fire protection systems.

Insulate air distribution devices to prevent condensation formation.

1.4 DESIGN CONDITIONS

A. Acoustical: Noise produced at each diffuser, register, grille or other air distribution device shall not exceed a noise criteria level of NC 35 based on sound pressure levels in db re 0.002 microbars unless otherwise indicated. Coordinate air distribution devices, sound attenuation measures and equipment actually provided to insure that this design constraint is not exceeded by the system installed.

Exceptions: Any particular rooms or areas which are normally occupied by other than maintenance staff or service staff and which may be noted on the drawings as requiring lower NC criteria.

B. Pressure Drop: Pressure drop across any air distribution device shall not exceed 0.15 in wg static pressure unless otherwise indicated.

1.5 SHOP DRAWINGS

A. Refer to the requirements of Section entitled "General Mechanical Provisions".

1.6 MANUFACTURER

A. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:

1. Titus

2. Metalaire
3. Price
4. Krueger
5. Carnes

B. Manufacturers must be members of the Air Distribution Council unless otherwise indicated.

1.7 OTHER REQUIREMENTS

A. All aluminum is to be extruded unless otherwise indicated.

B. Appearance: Each air distribution device which has a portion thereof (frame, core, etc.) exposed to view in the finished area shall have a factory applied finish which matches and is compatible with the color of the surrounding surface on which the device is installed. Colors must be approved by Architect prior to device fabrication.

C. All louvers, dampers and/or shutters shall be rated by their manufacturer in accord with AMCA Standard 500-74.

D. Integral Components: All dampers, blank-off baffles and other companion devices which form an integral part of air distribution device shall be factory made items produced by the manufacturer of air distribution device.

E. Louvers: Louvers may be specified in another division but for reference may also be indicated on mechanical drawings.

F. Door Grilles: Door grilles may be specified in another division but for reference may also be indicated on mechanical drawings.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide the following air distribution devices as applicable to this project. Refer to air distribution device schedule as shown on drawings.

2.2 OTHER REQUIREMENTS

A. All devices must each comply with the applicable portions of the Air Diffusion Council (ADC) Equipment Test Code 1062R4 "Certification, Rating and Test Manual", the Air Movement and Control Association, Inc. (AMCA) Standard 500 "Test Method for Louvers, Dampers and Shutters" and the "National Fire Protection Association" (NFPA) Standard 90A "Installation of Air Conditioning and Ventilating Systems".

B. Provide ceiling and/or linear diffusers with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems which will contain each type of diffuser.

C. Diffusers, grilles and registers installed in fire rated ceiling, or floor/ceiling assemblies shall be constructed of steel.

D. Mounting Screws: Where grilles, diffusers or registers are specified which require mounting screws visible from the face of the device these screws shall be furnished with the air

distribution equipment and be finished at the factory to match the finish on the grille, diffuser or register in which they are to be used.

PART 3 - EXECUTION

3.1 GENERAL

A. Install neatly where indicated in accord with manufacturer's recommendations and in accord with SMACNA recommendations and as otherwise indicated.

B. Properly test, balance and adjust to produce quiet, draftless operation to best degree possible.

3.2 INSTALLATION

A. Rectangular Diffusers: Where diffusers are the lay-in type, they shall be supported by the inverted T-bar suspension system but all ducts connected thereto shall be supported independently of the ceiling as specified under Section entitled "Ductwork". Surface mounted diffusers shall be supported by the duct runouts or drops where sheet metal ducts are indicated and by separate hangers where flex runouts are indicated. All rectangular ceiling diffusers shall be installed with their lines parallel and perpendicular to the building line and properly aligned with the ceiling.

B. Sidewall Grilles and Registers: Mount securely to the duct system flanges using finish screws and in accordance with accepted good practice.

C. Ceiling mounted Exhaust and Return Registers/Grilles: Mount as specified hereinbefore for surface mounted ceiling diffusers except use finished screws provided and secure to duct and finished ceiling (or finished ceiling for nonducted returns) in accordance with the manufacturer's instructions. Where required to provide adequate support for nonducted registers or grilles, provide appropriate mounting frame for incorporation into the ceiling system.

D. Install all outlets and inlets as recommended by the manufacturer; in accordance with recognized industry practices; to insure that products serve intended functions.

E. Locate ceiling air outlets and inlets as indicated on the drawings. Unless otherwise indicated, locate units in center of acoustical ceiling modules. Install square and parallel with partitions, ceiling grid members, etc.

F. Spare Parts: Furnish to Owner, with receipt, 3 operating keys for each type of outlet and inlet that require them.

G. Do not install blank-offs under continuous linear diffuser distribution plenums. Distribution plenums shall cover only active portion of the diffuser.

3.3 PROTECTION OF WORK UNTIL FINAL ACCEPTANCE

A. Coordinate the installation of the air distribution equipment with related work and finishing of adjacent surfaces to prevent damage to the devices or adjacent finishes. Protect the finish of all air distribution equipment until final acceptance. Replace or repair to the Architect's satisfaction any damaged equipment.

END OF SECTION 23 37 13

SECTION 23 37 25
LOUVERS

PART 1 - GENERAL

1.1 SCOPE

A. Provide complete louver assemblies as indicated on Drawings and in Specifications.

1.2 SHOP DRAWINGS

A. Refer to the section entitled "General Mechanical Provisions".

1.3 CERTIFICATION

A. All performance shall be certified by AMCA and bear the AMCA Certified Ratings Seal for Air Performance and Water Penetration in accord with AMCA Standard 550.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Stationary type; extruded aluminum construction.

B. All components factory assembled by the louver manufacturer including heads, jambs, sills, blades and mullions. Louver sizes too large for shipping shall be assembled at the site from factory assembled louver sections to provide the overall sizes required.

C. Frame:

1. 4-inch depth.
2. Suitable for mounting in the type of wall where indicated. Coordinate with wall construction indicated on architectural drawings.
3. Extruded aluminum of 0.100-inches minimum thickness.
4. Provided with caulking slots.

D. Blades:

1. Drainable type with drain gutter in each blade and downspouts in jambs and mullions.
2. Extruded aluminum of 0.081-inch minimum thickness.
3. Approximately 37-1/2-degree blade angle.
4. Blades on approximately 3-inch centers.

E. Finish:

1. Clear anodized.

F. Operating characteristics:

1. High free area.
2. Low water penetration.
3. Free area based on air velocity of not greater than 500 fpm.
4. Air flow pressure drop in intake mode or exhaust mode of not greater than 0.025-inches w.g.s.p.

G. Design: Limit span between visible mullions to 10-feet and shall incorporate such other structural supports required to withstand a wind load of 50 lbs. per sq. ft.

H. Size: As scheduled or shown on Drawings or as required to comply with the above operating characteristic constraints.

2.2 ACCESSORIES

A. Bird screen: Aluminum, 3/4-inch mesh, typical for all louvers.

B. Insect screen: Aluminum, 18-16 mesh, where indicated on drawings.

C. Frame: Flange, 1-1/2-inch nominal width for louvers of sizes 24" wide X 12" high and smaller; non-flanged, suitable for cased opening mounting for louvers of sizes greater than 24" wide x 12" high.

2.3 ACCEPTABLE MANUFACTURERS

A. Basis of Design: Ruskin Model ELF-6375DXD. Acceptable: equivalent products of American Warming & Ventilating; Carnes; Greenheck; Krueger; Louvers & Dampers, Inc., Metal Industries; or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Install in accord with manufacturer's recommendations and in accord with applicable portions of current SMACNA guidelines.

B. Installation shall be watertight between complete circumference of frame and wall.

C. Coordinate complete installation with other work related to structure, wall construction, ductwork (if any) and other such interfaces.

D. For additional requirements, refer to Architectural drawings and other portions of the Contract Documents.

END OF SECTION 23 37 25

SECTION 23 41 00
AIR FILTER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Furnish and install complete air filter assemblies of the types, sizes and capacities indicated.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

1.4 SHOP DRAWINGS

A. Include complete performance data at the scheduled operating conditions; dimensions; weights; performance curves; airside pressure losses; quantities; descriptions; and any other necessary information.

PART 2 - PRODUCTS

2.1 GENERAL

A. Filters shall pass applicable air quantities at velocities and pressure drops which are within manufacturer's recommended operating ranges and as specified and scheduled.

B. Filter Manufacturers: Continental; American Air Filter; Cambridge; Farr; Flanders; Purafil; or equivalent.

C. Filter Housing Apparatus Manufacturers: Same manufacturer as the applicable filters or same manufacturer as the air handling unit in which installed, whichever manufacturer is applicable.

D. Air Handling Unit Filter Sections: Shall be of adequate size to accept specified filters. Air handling unit filter sections shall be factory made by air handling unit manufacturer or by filter manufacturer to be specifically compatible with applicable air handling unit.

E. Fan Coil Unit and Fan Powered Terminal Unit Filter Box: Integral part of fan coil unit or terminal unit assembly.

1. Access: Filter sections shall be designed for side service access unless otherwise indicated.

2.2 REPLACEABLE THROWAWAY FILTERS, 1-INCH THICK

A. Dacron or fibrous glass multi-ply fiber with 3 graduated density plies. Equal to Continental Conoply Type LD 3 ply, AAF 5700. Galvanized steel or aluminum or fiberboard frame suitable for mounting in applicable filter box. Minimum efficiency: 25% NBS atmospheric

dust spot efficiency. Applicable uses: fan coil units; fan powered terminal units at heating coils contained therein.

2.3 INITIAL PREFILTERS FOR AIR HANDLING UNITS

A. Filter Housing: Integral part of air handling unit assembly. (If not part of AHU assembly, provide external filter housing.)

B. Filters: Extended surface, pleated panel type; disposable; double-wall chipboard frame with diagonal support members; 2-inches thick; average efficiency no less than 25-30% based on ASHRAE 52.2-99 test method; operate at an initial resistance of not more than 0.25-inches w.g.s.p. at 500 fpm face velocity. Design base: Farr 30/30.

2.4 FINAL PREFILTERS FOR AIR HANDLING UNITS

A. Filter Housing: Integral part of air handling unit assembly. (If not part of AHU assembly, provide external filter housing.)

B. Filters: Air filters shall be high performance, extended area, deep pleated, disposable type. They shall consist of a filter element, media retainer holding frame and sealer frame. The filter element shall be of the high performance, pre-formed, deep pleated, disposable type. The media shall be microfine glass fiber which is reinforced by a laminated synthetic backing. The filter shall have an average efficiency of 80-85% on ASHRAE Test Standard 52.2-99. It shall have an average arrestance of no less than 98%. The filter shall be listed by Underwriters' Laboratories as Class 1.

C. Media retainer: shall be of welded steel construction and shall be designed in such a manner that it supports the multiple pleats of the filter element against the direction of airflow. The media retainer shall be PVC coated and designed to totally eliminate the possibility of oscillation and/or sagging. Holding Frames shall be factory fabricated of 16 gauge galvanized steel and shall be equipped with gaskets and four spring type positive sealing fasteners. Fasteners shall be capable of being attached or removed without the use of tools. Sealer frames shall be fabricated of 20 gauge galvanized steel and shall be equipped with gasketing material on the rear flange of the sealer frame.

D. Design Base: Farr HP-100.

2.5 EXTERNAL FILTER HOUSING FOR AIR HANDLING UNIT FILTERS

A. Filter Housing: Holding frame of galvanized steel reinforced with bracing and gussets; constructed to provide positive air seal and retainage of filter elements; doors equipped with heavy duty latches and resilient gasketing; designed for side access. Housing shall accept both initial and final prefilters. Applicable uses: where filter housing is not an integral part of air handling unit assembly. Design base: Farr Model 3P Universal Glide/Pack.

2.6 ACTIVATED CARBON FILTERS

A. Activated carbon filters shall be the full flow high velocity type. Each filter shall contain 90 pounds of activated carbon per 2000 CFM. Filters shall be of size and quantity as indicated on the plans. The casing shall be constructed of galvanized steel: The activated carbon in each filter shall be contained in removable panels constructed of high heat, medium impact polystyrene plastic, to withstand corrosion, and so installed as to preclude the possibility of air bypass. The panels shall contain internal separators to minimize the settling of the carbon and shall be capable of being refilled by the owner. The activated carbon shall have an

activity rating of at least 50 minutes by the Standard Government Accelerated Chloropicrin Test. Design base: Farr CF-4.

2.7 HEPA FILTERS

A. Each module shall consist of an all metal corrosion resistant steel casing, steel center divider, filter pack, adjustable flow control, spun steel inlet collar, face screen and integral provisions for attachment of seismic restraints. Module shall be provided for use in lay-in type ceiling and shall be custom manufactured in size as required to fit the lay-in ceiling furnished.

B. The filter pack shall be made with pleated all-glass filter media and safe-edge corrugated aluminum separators. The filter media, separators, and casing components shall be encapsulated in a high stability compound to eliminate any possibility of leaks around the filter media or through the casing joints.

C. The flow control system shall provide each module with the capability of being adjusted to a specified discharge velocity between 25 and 110 fpm with a supply air static pressure between 0.5" and 2.0" w.g. The discharge velocity shall be uniform across the projected face of the module within a tolerance of + 20 fpm.

D. Flow control adjustments and measurements shall be made from the discharge face of the module. A single port of volumetric flow and filter resistance measurements and adjustments and measurement of upstream test aerosol concentration shall be provided in the face of the unit.

E. The module shall be protected by a diamond perforated anodized aluminum screen sealed to the face of the unit. The module shall provide a minimum of 5/8" of bearing and sealing surface when installed on a 1-1/2" T-Bar system.

F. The complete module shall be manufactured, tested and supplied by filter manufacturer. The completed unit shall be tested for efficiency and leaks and certified to have a minimum efficiency of 99.99% on 0.3 micron thermally generated particles and be leak-free per Federal Standard 209B.

G. After test and cleaning, the module face and inlet collar shall be sealed with removable shields to prevent further contamination and protect against damage.

H. Design Base: Cambridge model CAM-1.

PART 3 - EXECUTION

3.1 GENERAL

A. Arrangement and Access: Arrange, install and make provisions for easy access to and removal and replacement of filters. Provide access doors and/or panels as necessary.

B. Coordination and Matching: Coordinate assembly components and properly match sizes and quantities of filters with related air moving systems (e.g., air handling units, fan coil units, filter banks) so that filter assemblies will operate in accord with operating conditions, sizes and capacities as listed in this section or as otherwise indicated.

3.2 MANOMETER

A. Provide a filter manometer for each separate filter bank type (e.g., initial prefilter bank, final prefilter bank) of each air handling unit filter assembly. Do not provide for fan coil units or

terminal units. Units shall be complete with pressure fittings, tubing, vent valves, lags, fluid, and the like as required for a complete installation. Acceptable: Dwyer Series 250-AF with pressure range as applicable for filter bank. Not required for fan coil units. Manometers shall be installed in strict accordance with the manufacturer's instructions and in a manner which will not compromise filter access. Provide mounting brackets as required for proper installation. Set red and green signal flags for proper indication of status of the filters involved.

3.3 MISCELLANEOUS SUPPORT STEEL AND HARDWARE

A. Provide as required to provide for adequate support and structural integrity of each filter bank. In no case shall supplementary supports be less than those indicated or recommended by the filter manufacturer in his standard installation instructions.

3.4 FILTER ASSEMBLY LOCATIONS

A. Where scheduled and shown on the drawings.

3.5 ORIGINAL AND SPARE FILTER SETS

A. Provide an original filter set and two (2) spare filter sets for each unit having an air handling equipment filter assembly specified above. Upon initial start-up, each filter assembly shall be provided with a complete original filter set. Prior to or at the time of final test and balance, this original filter set shall be replaced with a complete new spare filter set. However, if at the time of final test and balance there is still useful operating life remaining in the initial filter set (i.e. the filters are still operating within their recommended pressure drop limits for the particular application), then the Contractor (if he is given written approval by the final test and balance agency) may give the spare filter sets to the Owner (at a place of the Owner's selection on the site) in lieu of replacing the original filters with the spare filters.

END OF SECTION 23 41 00

SECTION 23 43 24
AIR PURIFICATION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes the design, performance and installation of an air purification system intended for use as part of another manufacturer's air handling unit or mounted on the duct as shown on the plans, details and equipment schedules.

1.2 REFERENCED CODES AND STANDARDS

A. The following codes and standards are referenced through out. The edition to be used is that currently enforced by the authority having jurisdiction (AHJ) or in absence of such direction that referenced by the current enforceable IBC code or as indicated by the contract documents, except where specifically referenced by this section of the specifications.

1. ASHRAE Standards 62 & 52
2. National Electric Code NFPA 70
3. UL 867

1.3 RELATED WORK

A. Testing, Adjusting and Balancing

B. Facility Access and Protection

C. Ductwork

D. Filters

E. Water and Refrigerant Piping

F. Electrical Wiring

G. Control Wiring

1.4 QUALITY ASSURANCE

A. The Air Purification System shall be a product of an established manufacturer within the USA.

B. A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system to ensure installation in accordance with manufacturer's recommendation.

C. Technologies that do not address gas disassociation such as UV Lights, Powered Particulate Filters and/or polarized media filters shall not be considered. Uni-polar ion generators shall not be acceptable. "Plasma" particulate filters shall not be acceptable.

D. Projects designed using ASHRAE Standard 62, IAQ Procedure shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted. The manufacturer shall provide independent test data on a previous

installation in a similar application, that proves compliance to ASHRAE 62 and the accuracy of the calculations.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for ion generators including:

1. Schedule of plasma generators indicating unit designation, number of each type required for each unit/application.
2. Data sheet for each type of plasma generator, and accessory furnished; indicating construction, sizes, and mounting details.
3. Performance data for each type of plasma device furnished.
4. Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled (when projects are designed with outside air reduction).
5. Product drawings detailing all physical, electrical and control requirements.

B. Operating & Maintenance Data: Submit O&M data and recommended spare parts lists.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver in factory fabricated shipping containers. Identify on outside of container type of product and location to be installed. Avoid crushing or bending.

B. Store in original cartons and protect from weather and construction work traffic.

C. Store indoors and in accordance with the manufacturers' recommendation for storage.

1.7 WARRANTY

A. Equipment shall be warrantied by the manufacturer against defects in material and workmanship. This guarantee shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System at Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

A. The air purification system(s) shall be of the size, type, arrangement and capacity indicated and required by the unit furnished and shall be of the manufacturers specified.

B. Acceptable Manufacturers: Plasma Air, Global Plasma Solutions, Bioclimatic.

C. All other Suppliers of comparable products requesting prior approval shall:

1. Submit for prior approval in accordance with the requirements of Section 230100.
2. In addition, manufacturers submitting for prior approval for Bi-Polar Ionization must as part of the prior approval request provide their ASHRAE 62.1-2007 calculations that prove conformance to the ASHRAE Standard with the reduction of outside air to the scheduled values. A letter on the manufacturer's letterhead requesting prior approval must accompany the request for prior approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application shall also be included.

2.2 BI-POLAR IONIZATION DESIGN AND PERFORMANCE CRITERIA

A. Each piece of air handling equipment, so designated on the plans, details, equipment schedules and/or specifications shall contain a Plasma Generator with Bi-polar Ionization output as described here within.

B. The Bi-polar Ionization system shall be capable of:

1. Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).
2. Controlling gas phase contaminants generated from human occupants, building structure, furnishings and outside air contaminants.
3. Capable of reducing static space charges.
4. Effectively reducing space particle counts.

C. The bi-polar ionization system shall operate in a manner such that equal amounts of positive and negative ions are produced. Uni-polar ion devices shall not be acceptable.

1. Air exchange rates may vary through the full operating range of a constant volume or VAV system. The quantity of air exchange shall not be increased due to requirements of the air purification system.
2. Velocity Profile: The air purification device shall not have maximum velocity profile.

D. Humidity: Plasma Generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0 - 100%, condensing, shall not cause damage, deterioration or dangerous conditions within the air purification system.

E. Equipment Requirements:

1. Electrode Specifications (Bi-polar Ionization):

a. Each Plasma Generator with Bi-polar Ionization output shall include the required number of electrodes and power generators sized to the air handling equipment capacity. Bi-polar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, performance output reduction over time, ozone production and corrosion.
b. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating.
c. Manufacture shall demonstrate that no voltage potential exists due to exposed electrical components.

F. Air Handler Mounted Units:

1. Where so indicated on the plans and/or schedules Plasma Generator(s) shall be supplied and installed. The mechanical contractor shall mount the Plasma Generator and associated power supplies. All interconnecting wiring shall be UL and NEC NFPA 70 approved. Electrical contractor shall provide a [<120Volt>, <230 Volt>] circuit to the ion generators.

G. Ionization Requirements:

1. Plasma Generators with Bi-polar ionization output shall be capable of controlling gas phase contaminants and shall be provided for all equipment listed above.

a. The Bi-polar ionization system shall consist of Bi-Polar Plasma Generator and power supply. The Bi-polar system shall be installed where indicated on the plans or specified

to be installed. The device shall be capable of being powered by 110VAC to 208VAC to 240VAC without the use of an external transformer. Ionization systems requiring isolation transformers shall not be acceptable.

b. Ionization Output: The ionization output shall be controlled such that an equal number of positive and negative ions are produced. Imbalanced levels shall not be acceptable.
c. Ionization output from each electrode shall be a minimum of 15 million ions/cc when tested at 2" from the ionization generator.

2. Ozone Generation:

a. The operation of the electrodes or Bi-polar ionization units shall conform to UL 867-2007 with respect to ozone generation.

H. Electrical Requirements:

1. Wiring, conduit and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. Plasma Generator shall accept an electrical service of 115 VAC to 240VAC, 1 phase, 50/60 Hz.

I. Control Requirements:

1. All Plasma Generators shall have internal short circuit protection, overload protection, and automatic fault reset.
2. The installing contractor shall mount and wire the Plasma device within the air handling unit specified or as shown or the plans. The contractor shall follow all manufacturer IOM instructions during installation.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for maintaining all air systems until the owner accepts the building (Owner Acceptance).

3.2 ASSEMBLY AND ERECTION: PLASMA GENERATOR WITH BI-POLAR IONIZATION

A. All equipment shall be assembled and installed in a workman like manner to the satisfaction of the owner, architect, and engineer.

B. Any material damaged by handling, water or moisture shall be replaced, by the mechanical contractor, at no cost to the owner.

C. All equipment shall be protected from dust and damage on a daily basis throughout construction.

3.3 TESTING

A. Provide the manufacturers recommended electrical tests.

3.4 COMMISSIONING AND TRAINING

A. A manufacturer's authorized representative shall provide start-up supervision and training of owner's personnel in the proper operation and maintenance of all equipment.

END OF SECTION 23 43 24

SECTION 23 54 17
HEATING COILS: ELECTRIC DUCT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

A. Provide factory assembled and prewired electric duct heaters where indicated. Heater capacities, sizes and operating characteristics shall be as scheduled on drawings or as indicated in other sections.

1.3 RELATION TO OTHER WORK

A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 23 and to all other applicable portions of the Drawings and Specifications.

1.4 SHOP DRAWINGS

A. Refer to requirements of Section entitled "General Mechanical Provisions". Include complete data on heater sizes; required clearances; direction of air flow; control box construction and dimensions; power and control wiring (both factory and field); operating and safety controls; and capacities and operating characteristics.

1.5 MANUFACTURERS

A. Equipment items listed in the schedule on the drawings are based on a specific manufacturer to establish the desired style, quality, performance, and type of equipment. Equal products, complying with the required installation shown on the plans and with these specifications, by the following manufacturers are acceptable:

1. Brasch
2. Tennessee Plastics
3. Indeeco
4. Electric Heaters Division of I.T.E.
5. Valley Industries
6. Dell
7. Greenheck

PART 2 - PRODUCTS

2.1 GENERAL

A. Each heater shall be UL listed for zero clearance, open coil slip-in type for duct mounting. Sizes, direction of air flow, mounting position, electrical characteristics, and heating capacities shall be as indicated.

1. Meet all applicable requirements of current NEC.
2. UL listed including all built-in components.

3. Be entirely suitable for installation in the indicated locations (ductwork or air handling unit(s) as applicable).
4. Coordinated with the specified requirements of the mechanical system control system.

2.2 MATERIALS AND CONSTRUCTION

A. Galvanized or aluminized steel frame and terminal box with hinged cover.

B. Maximum watt density of 35 watts per square inch of resistance wire surface area (unless otherwise specified).

C. Terminals recessed into air stream 1-1/4 inches minimum.

D. Stainless steel resistance coil terminals and nuts.

E. Iron free resistance wire of 80% nickel and 20% chromium.

F. Reinforced resistance wire bracket supports spaced no greater than four inches apart with stiffening ribs and gussets.

G. Securely positioned terminal insulators and bracket bushings of high quality ceramic.

H. Dielectrically tested for 1000 volts plus twice the rated voltage of 2000 volts, whichever is greater.

I. Heat limiter in each energized heating element power line.

J. Balanced three phase delta connected load if three phase heaters are specified.

K. Insulated terminal box to prevent condensation.

L. Full fine break mercury contactors which will break all ungrounded conductors (note horizontal, vertical or oblique position of each heater assembly as shown on drawings).

M. Transformer with primary fusing if control voltage is different from supply voltage.

N. Overcurrent protection consisting of automatic circuit breaker(s) each installed in accord with NEC requirements.

O. Manual reset thermal cutout in series with a disc type, automatic reset thermal cutout for primary protection, and heat limiters in the heating element power lines to de-energize the elements if the primary cutout fails. Devices shall be serviceable through the terminal box without having to remove heater from duct.

P. Control terminals and power terminals.

Q. Pneumatic-electric switches (one per heater step) when control signal is pneumatic.

R. Built-in or remote pressure type air flow switch. Install in series with automatic reset thermal cutout.

S. Factory mounted integral disconnect switch.

PART 3 - EXECUTION

3.1 GENERAL

A. Arrange and install heater to provide uniform heating of air stream.

B. Properly and firmly support in each location.

3.2 PLACEMENT

A. Heater locations shall be essentially as shown on drawings; however, actual placement shall be verified using field measurements and data relating to the equipment actually approved for installation on this project. Heaters and all controls shall be arranged for horizontal or vertical, top, side or bottom mounting as indicated on drawings. Heater installation shall conform to all governing codes as to clearances, disconnect means, wiring, and like items.

B. Support: Provide duct hangers, and specified in section entitled "Ductwork", immediately adjacent to both sides of heater at both sides of the duct.

C. Duct Openings: Shall be accurately cut, properly reinforced, and gasketed as required for an air tight installation. Insulation shall be finished up to the control box in such a manner as not to compromise service access to heater and provide a proper vapor seal at the edge of the insulation.

3.3 CONTROL COORDINATION

A. Coordinate and provide all items necessary for each heater to operate in accord with the control system sequences and methodology described in other sections of this division.

3.4 TEST AND BALANCE

A. All heater performance shall be certified by test and balance procedures as specified in section covering testing and balancing.

3.5 CLEANING AND PROTECTION

A. Contractor shall protect the heaters from damage from the time of their receipt until final acceptance and shall thoroughly clean the complete heater (including interior of control box) of all dirt and construction debris prior to requesting final inspection. Control box, access door, elements, control and like items which become damaged during the course of construction shall be required to "as new" condition or shall be replaced with new material or equipment components.

3.6 WIRING DIAGRAMS

A. Provide complete wiring diagram furnished by the heating coil system manufacturer to the mechanical systems control manufacturer and the electrical contractor. This wiring diagram shall completely indicate in full detail all electrical and control wiring requirements, terminals, etc., necessary to allow the control manufacturer and electrical contractor to completely coordinate their respective wiring portions of the heating coil system installation.

END OF SECTION 23 54 17

SECTION 23 81 44
AIR CONDITIONING UNITS, PACKAGED ROOFTOP

PART 1 - GENERAL

1.1 SCOPE

A. Provide packaged rooftop air conditioners where indicated on the drawings. Unit capacities and operating conditions shall be as scheduled on the drawings.

1.2 RELATION TO OTHER WORK

A. Coordinate shop drawings; equipment ordering, delivery and placement; structural framing; roof construction; roofing; utility connections. Refer to the Section entitled "General Provisions".

1.3 SHOP DRAWINGS

A. Refer to the Section entitled "General Provisions". Include complete data on roof curbs; duct opening requirements; equipment weights; power and control wiring (both factory and field); operating and safety controls; capacities and rating conditions; and equipment sound power levels in each octave band.

1.4 WARRANTY

A. Include the cost of one year's warranty on entire system plus an additional four years warranty on refrigerant system and all components thereof. The first year's warranty shall comply with the standard warranty (guaranty) provisions of these specifications. The additional four year warranty shall include parts, refrigerant and oil, exclusive of labor.

1.5 MANUFACTURER

A. Design Basis: Units used as a design basis are Weatherking Series DFC.

B. Acceptable Manufacturers: Trane, Carrier, Lennox, Bryant, Command Aire or equal.

PART 2 - PRODUCTS

2.1 FRAME

A. Unit shall be completely factory assembled with all components mounted on a one piece unitized frame. Frame shall be constructed of extruded aluminum or welded steel. Frame shall incorporate lifting lugs for purposes of rigging and setting the unit in place.

2.2 CASING

A. Unit casing shall be not less than 14 gauge zinc coated steel, phosphatized, epoxy primed, and finished with enamel. Casing roof shall utilize one piece construction with all seams filled with sealant. Access shall be provided by means of access panels furnished in sufficient number and size to enable ready access to all controls, fans, coils, filters, compressors, refrigerant system accessories, and service valves. Access panels shall be gasketed neoprene seals.

2.3 REFRIGERANT COILS

A. Refrigerant coils shall be constructed of seamless copper tubes with aluminum heat transfer fins mechanically bonded thereto. Condenser coils shall be tested at not less than 400 psig and proved tight. Evaporator coils shall be tested at not less than 300 psig and proved tight.

B. Units scheduled as having two compressors must be provided with two compressors; single compressor units are not acceptable unless scheduled as such.

2.4 ELECTRIC HEATER

A. Provide electric resistance heating coils, of the capacities scheduled, as integral factory mounted and wired equipment. Heating coils shall be of heavy duty nickel chromium wire and incorporated manual and auto reset high limit protection devices and air flow interlock devices. Heaters shall be UL labeled.

2.5 FANS

A. Supply Air Fans: Supply air fans shall be double width, double inlet forward curved blade type and shall be both statically and dynamically balanced. Fans shall be of the belt type. Drives shall conform with the Section entitled "General Provisions".

B. Condenser Fans: Shall be propeller type, direct drive, statically and dynamically balanced and protected with metal guards on discharge side.

2.6 FILTERS

A. Two inch (2") thick throwaway filters which shall filter both return and outside air handled by unit. Filter media shall be non-organic long fiber mineral glass type with viscous coating and shall be UL Class 2. Filter average dust spot efficiency atmospheric shall be not less than twenty-five percent (25%). Filter face velocity shall not exceed 500 fpm.

2.7 COMPRESSORS

A. Unit compressor(s) may be of the hermetic or semi-hermetic type.

2.8 REFRIGERANT CIRCUIT ACCESSORIES

A. The following refrigerant accessories shall be included: Suction accumulator; backseating compressor suction and discharge valves with gauge ports on serviceable hermetics; high and low pressure service gauge ports and valves; filter drier; sight glass and moisture indicator; thermostatic expansion valves; and crankcase heater. Where units have multiple compressors, the above shall apply to each compressor refrigerant circuit.

2.9 INSULATION

A. All casing panels and all interior surfaces of exterior casing members in contact with air stream shall be insulated with not less than one inch (1") expanded foam or glass fiber insulation. All unit insulation and adhesives shall comply with the requirements of NFPA 90A as to flame spread and smoke developed ratings.

2.10 ROOF CURB

A. Unit shall be furnished complete with National Roofing Contractor's Association approved roof curb constructed of not less than 14 gauge zinc coated steel with gasketed supply and return air openings. Curb height shall be a minimum of twelve inches (12").

2.11 UTILITY CONNECTIONS

A. Utility connection openings may be provided within the roof curb enclosure, or on the exterior of the unit provided a good water seal is provided to prevent leakage within the unit.

2.12 CONTROLS

A. General: Units shall be furnished and installed complete with all system operating and safety controls specified herein and as otherwise required for a complete and operable system. Controls shall be of the electric and electronic type. Unit controls shall operate at 115V AC and all remote controls shall be low voltage (less than 50V AC).

B. Refrigerant Controls: Refrigerant controls shall include short cycle protection; high pressure cutout; low pressure cutout; and oil pressure failure protection switch (on serviceable hermetics).

C. Room Controls: Each unit shall be provided with an individual space control capable of matching system heat input on heat removal to space heat loss or heat gain sufficiently close to maintain a space temperature within plus or minus two (2) degrees of thermostat setpoint.

D. Thermostat: Provide for each unit a remote thermostat located in the space served by the unit. Thermostat shall have the following minimum control features:

1. System heat-off-cool selector switch.
2. Fan on-auto switch.
3. Power and filter status indicated lights.

E. Automatic Time Switch: Furnish and install an electric time switch with electrically would synchronous carryover feature to start and stop the unit with system selector switch in the "auto" position. Clock shall be capable of starting and stopping unit at different times on different days and of skipping days. Provide time clock override switch for each unit.

PART 3 - EXECUTION

3.1 PLACEMENT AND MOUNTING

A. Unit location shall be essentially as shown on drawings. However, actual placement of the roof curb shall be verified using field measurements and data relating to the equipment approved for actual installation on this project. The roof decking, roof slab, and roof insulation shall be continuous throughout the area enclosed by the curb with the exception of the actual supply and return duct penetrations. Duct penetrations shall be continuously sealed using a non-hardening sealant.

3.2 WIRING

A. All control, and interlock wiring shall be run in conduit and shall be performed as work of Division 23.

3.3 DUCT CONNECTIONS

A. Supply and return ducts shall be connected to their respective unit duct collars using flexible connectors. These connectors shall be installed properly so that they are not in tension and are aligned with their respective ducts.

3.4 MANUFACTURER'S FIELD SUPERVISION

A. Provide the services of an authorized representative of the equipment manufacturer who shall personally supervise the following: check out of all field wiring; unit start up; and unit test and balance including control calibration.

3.5 TESTING AND BALANCING

A. Refer to Section describing test and balance.

END OF SECTION 23 81 44

SECTION 26 01 00
BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-01 Specification Sections, apply to work of this Section.

B. Coordination of work between mechanical and electrical trades is covered in Division-23 Section “GENERAL MECHANICAL PROVISIONS”.

1.2 SUMMARY

A. This Section specifies the basic requirements for electrical installations and includes requirements common to all sections of Division-26. It expands and supplements the requirements specified in sections of Division-01.

1.3 CODES AND STANDARDS

A. Install all work in accordance with the applicable requirements of the latest edition of the following:

1. National Electric Code (NEC)
2. Local, State, County and City Codes
3. National Fire Protection Association (NFPA)
4. American National Standards Institute (ANSI)
5. NEMA Standards

B. It is the intent of the Contract Documents to comply with the applicable codes, ordinances, regulations, and standards. Where discrepancies occur, notify the Architect in writing, and ask for interpretation. Correct any installation that fails to comply with the applicable codes and standards at no additional cost to the Owner.

C. All materials shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data shall be submitted to prove to the Engineer that equipment meets or exceeds available standards.

1.4 PERMITS AND INSPECTIONS

A. Obtain and make all payments for permits and inspections required. At the completion of the project and before final acceptance of the electrical work, provide evidence of final inspection and approval by the authorities having jurisdiction.

1.5 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of electrical products specified, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with electrical work similar to that required for this project.

1.6 IDENTIFICATION

A. The following items shall be equipped with nameplates: All motors, motor starters, motor-control centers, pushbutton stations, control panels, time switches, disconnect switches, panelboards, circuit breakers, contactors.

B. Nameplates shall adequately describe the function of the particular equipment involved. Nameplates for panelboards and switchboards shall include the panel designation, branch (normal or emergency), voltage and phase of the supply. For example, "Panel A, Emergency Branch, 480Y/277V, 3-phase, 4-wire."

C. Nameplates shall be laminated phenolic plastic, black front and back with white core, with 3/8 inch high lettering etched through the outer covering. White engraved letters on black background. Attach with plated self-tapping screws or brass bolts.

D. Provide nameplates on all existing equipment that a circuit under this contract is fed from.

E. All junction box covers shall be hand marked with a 1/8 inch wide permanent black marking pen, indicating panel and circuit numbers contained, or system contained, i.e., fire alarm, telephone, etc.

1.7 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected, and architectural room elevations.

1.8 ELECTRICAL INSTALLATIONS

A. Coordinate electrical equipment and materials installation with other building components.

B. Verify all dimensions by field measurements.

C. Arrange for chases, slots, and openings in other building components to allow for electrical installations.

D. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.

E. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.

F. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.

G. Coordinate connection of electrical systems with local utility services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connections for each service.

1.9 CUTTING AND PATCHING

A. This Article specifies the cutting and patching of electrical equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.

B. Do not endanger or damage installed Work through procedures and processes of cutting and patching.

C. Arrange for repairs required to restore other work, because of damage caused as a result of electrical installations.

D. No additional compensation will be authorized for cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.

E. Perform cutting, fitting, and patching of electrical equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed work;
2. Remove and replace defective Work;
3. Remove and replace Work not conforming to requirements of the Contract Documents;
4. Remove samples of installed Work as specified for testing;
5. Upon written instructions from the Architect/Engineer, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.
6. Install electrical work in existing facilities.

1.10 ELECTRICAL SUBMITTALS

A. Refer to the Conditions of the Contract (General and Supplementary) and Division-01 Section: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES for submittal definitions, requirements, and procedures.

B. Submittal of shop drawings, product data, and samples will be accepted only when submitted by the Contractor. Data submitted from subcontractors and material suppliers directly to the Architect/Engineer will not be processed.

1.11 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Refer to the Instructions to Bidders and the Division-01 for requirements in selecting products and requesting substitutions. Where a listing of acceptable manufacturers has been given, use one of those manufacturers given only.

1.12 PRODUCT LISTING

A. Prepare listing of major electrical equipment and materials for the project.

B. Provide all information requested.

C. Submit this listing as a part of the submittal requirement specified in Division-01.

D. When two or more items of the same material or equipment are required they shall be of the same manufacturer, i.e., panelboards, motor starters, transformers, etc. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in Work, except as otherwise indicated.

E. Provide products which are compatible within systems and other connected items.

1.13 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.

B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.

C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.14 RECORD DOCUMENTS

A. Refer to the Division-01 Section: PROJECT CLOSEOUT or PROJECT RECORD DOCUMENTS for requirements. The following paragraphs supplement the requirements of Division-01.

B. Mark Drawings to indicate revisions to conduit size and location both exterior and interior; actual equipment locations, distribution and branch electrical circuitry; fuse and circuit breaker size and arrangements; support and hanger details.

C. Mark Specifications to indicate approved substitutions; Change Orders; actual equipment and materials used.

1.15 OPERATION AND MAINTENANCE DATA

A. Refer to the Division-01 Section; PROJECT CLOSEOUT or OPERATION AND MAINTENANCE DATA for procedures and requirements for preparation and submittal of maintenance manuals.

1.16 WARRANTIES

A. Refer to individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified in Divisions-26, 27 & 28, into a separate set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

C. Provide complete warranty information for each item to include product or equipment, date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.17 CLEANING

A. Refer to the Division-01 Section; PROJECT CLOSEOUT or FINAL CLEANING for general requirements for final cleaning.

B. Clean all light fixtures, lamps and lenses prior to final acceptance. Replace all inoperative lamps.

1.18 TEMPORARY POWER

A. Provide and pay for all temporary electrical service as required for construction.

B. Provide all temporary lighting and power distribution as required for construction. Temporary power design & installation shall be performed by the electrical contractor in coordination with the utility company.

1.19 ELECTRONIC FILES

A. CADD files will be available on a limited basis to qualified firms at the Architects prerogative. Recipients are cautioned that these files may not accurately show actual conditions as constructed. Users are responsible to verify actual field conditions. These files are not intended to be used as shop drawings.

1.20 EXISTING CONDITIONS

A. Prior to bid, the Contractor shall visit the existing facility and become familiar with existing conditions. Contractor shall include in his bid price, allowances for work to be performed in the existing operational areas of the facility. All work in existing operational areas shall be coordinated and scheduled with the facility, and may have to be performed during non-normal working hours.

B. All existing ceilings and finishes removed for installation of work under this Contract shall be replaced or returned to "like new" condition.

C. Existing piping, conduit and ductwork are located in areas of construction under this Contract. Contractor shall relocate or modify any existing piping, conduit or ductwork. Shutdown of existing systems for relocation shall be coordinated with the facility.

D. Before any construction begins, it shall be the responsibility of the Contractor to investigate and coordinate proposed new ceiling heights with existing conditions and ceiling space requirements for new lighting fixtures, ductwork, sprinkler, plumbing, piping and conduit systems.

E. It shall be the Contractor's responsibility to adjust existing and new ductwork, sprinkler, plumbing, piping and conduit systems to accommodate the work in the ceiling height provided. Architect shall be notified before construction begins if any ceiling space is not adequate for the work shown.

END OF SECTION 26 01 00

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN and XHHW.

D. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC with ground wire.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Feeders: Type THHN-THWN, single conductors in raceway

C. Branch Circuits: Type THHN-THWN, single conductors in raceway

D. Class 1 Control Circuits: Type THHN-THWN, in raceway.

E. Class 2 Control Circuits: Type THHN-THWN, in raceway, unless specified otherwise.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Conductor sizes indicated on circuit homeruns or in schedules shall be installed over the entire length of the circuit, unless noted otherwise on the Drawings or in these Specifications.

F. Before installing raceways and pulling wire to any mechanical equipment, verify electrical characteristics with final submittal on equipment to assure proper number and AWG of conductors. (As for multiple speed motors, different motor starter arrangements, etc.).

G. Coordinate all wire sizes with lug sizes on equipment, devices, etc. Provide/install lugs as required to match wire size.

H. Where oversized conductors are called for (due to voltage drop, etc.) provide/install lugs as required to match conductors, or provide/install splice box, and splice to reduce conductor size to match lug size.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

C. Where aluminum conductors are terminated, spliced or tapped, the connectors shall be color-coded, tool applied compression type made of aluminum with wire barrels factory prefilled with oxide inhibiting compound.

D. Connectors must pass UL Standard 486A-486B, bear markings AL7CU (75 degrees C) or AL97C (90 degrees C) for application, and have UL label.

E. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.

a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values.

C. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 05 19

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Grounding systems and equipment.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Stranded Conductors: ASTM B 8.
2. Tinned Conductors: ASTM B 33.
3. Bonding Conductor: Stranded conductor, minimum size per NEC.
4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches.

2.2 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet in length minimum, 20 feet in length where indicated.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install stranded conductors unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade.

C. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.

D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Armored and metal-clad cable runs.
7. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

E. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

F. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.

1. For telephone, alarm, voice and data, and other communication equipment, provide No. 6 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

G. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes shall be at least 12 inches deep, with cover.

1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

H. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building.

1. Install tinned-copper conductor not less than No. 4/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring not less than 24 inches from building's foundation.

I. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.

1. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.

a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
b. Perform tests by fall-of-potential method according to IEEE 81.

B. Grounding system will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

D. Report measured ground resistances that exceeds 5 ohms.

END OF SECTION 26 05 26

SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.2 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.4 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Allied Tube & Conduit.
    b. Cooper B-Line, Inc.; a division of Cooper Industries.
    c. ERICO International Corporation.
    d. GS Metals Corp.
    e. Thomas & Betts Corporation.
    f. Unistrut; Tyco International, Ltd.
    g. Wesanco, Inc.

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

    a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

        1) Cooper B-Line, Inc.; a division of Cooper Industries.
        2) Empire Tool and Manufacturing Co., Inc.
        3) Hilti Inc.
        4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
        5) MKT Fastening, LLC.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.

6. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.

6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69, spring-tension clamps.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi 28-day compressive-strength concrete.

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Surface raceways.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

1.2 DEFINITIONS

A. EMT: Electrical Metallic Tubing.

B. ENT: Electrical Nonmetallic Tubing.

C. FMC: Flexible Metal Conduit.

D. GRC: Galvanized Rigid (steel) Conduit.

E. IMC: Intermediate Metal Conduit.

F. LFMC: Liquidtight Flexible Metal Conduit.

G. RNC: Rigid Nonmetallic Conduit.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.
4. Electri-Flex Company.
5. O-Z/Gedney; a brand of EGS Electrical Group.
6. Southwire Company.
7. Thomas & Betts Corporation.
8. Wheatland Tube Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. IMC: Comply with ANSI C80.6 and UL 1242.

E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch, minimum.

F. EMT: Comply with ANSI C80.3 and UL 797.

G. FMC: Comply with UL 1; zinc-coated steel.

H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Fittings for EMT:

a. Material: Steel.
b. Type: Set-screw or compression.

2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
4. All metallic fittings shall be furnished with zinc-coating, or other approved application.

J. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.
3. Arnco Corporation.
4. CANTEX Inc.
5. Carlon Corp.
6. Condux International, Inc.
7. Electri-Flex Company.
8. Lamson & Sessions; Carlon Electrical Products.
9. RACO; a Hubbell company.
10. Thomas & Betts Corporation.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. ENT: Comply with NEMA TC 13 and UL 1653.

D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

E. LFNC: Comply with UL 1660.

F. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

G. Fittings for LFNC: Comply with UL 514B.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Technologies Company; Cooper Crouse-Hinds.
2. Hoffman; a Pentair company.
3. Hubbell Incorporated; Killark Division.
4. O-Z/Gedney; a brand of EGS Electrical Group.
5. RACO; a Hubbell Company.
6. Robroy Industries.
7. Thomas & Betts Corporation.
8. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations. Stamped steel boxes shall not be used in exposed areas.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

F. Metal Floor Boxes:

1. Material: Cast metal or sheet metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

H. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

I. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

J. Cabinets:

1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Quazite.
   b. Armorcast Products Company.
   c. Carson Industries LLC.
   d. CDR Systems Corporation; Hubbell Power Systems.
   e. NewBasis.
   f. Oldcastle Precast, Inc.; Christy Concrete Products.

2. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
3. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
4. Cover Legend: Molded lettering, "ELECTRIC."

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: EMT.
2. Concealed Conduit, Aboveground: Rigid steel conduit, GRC, IMC.
3. Underground Conduit: RNC, Type EPC-40-PVC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
6. Application of Handholes and Boxes for Underground Wiring:

   a. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer

concrete or Fiberglass-reinforced polyester resin, SCTE 77, Tier 15 structural load rating.

b. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer-concrete units, SCTE 77, Tier 8 structural load rating.

c. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf vertical loading.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Raceway locations include the following:

   a. Loading dock.
   b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
   c. Mechanical rooms.

3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: Rigid steel conduit
6. Raceways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: EMT.
7. Raceways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: EMT.
8. Raceways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: General-use, optical-fiber/communications-cable raceway or EMT.
9. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 3R stainless steel in damp or wet locations.

C. Minimum Raceway Size: 3/4 inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

G. Support conduit within 12 inches of enclosures to which attached.

H. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Change from ENT to GRC before rising above floor. Conduit shall be GRC for a minimum of 6 inches above penetration.
4. Protect conduit from corrosion at penetration through slab with PVC coating, bituminous mastic, or taping (2 inch wide minimum Scotchwrap No. 50 with 50% overlay.)

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

O. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:

1. 3/4-Inch Trade Size and Smaller: Install pathways in maximum lengths of 50 feet.

2. 1-Inch Trade Size and Larger: Install pathways in maximum lengths of 75 feet.
3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Where otherwise required by NFPA 70.

R. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

S. Expansion-Joint Fittings:

1. Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
    d. Attics: 135 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation.

T. Flexible Conduit Connections: Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations.

U. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

V. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

W. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. Install backfill.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits but a minimum of 6 inches below grade. Align planks along centerline of conduit.
7. Underground Warning Tape: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 44
SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

   a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
   b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Advance Products & Systems, Inc.
    b. CALPICO, Inc.
    c. Metraflex Company (The).
    d. Pipeline Seal and Insulator, Inc.
    e. Proco Products, Inc.

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.3 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.4 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

    1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

2.5 FIRE RATED RACEWAY AND CABLE PENETRATION

A. System used for penetrations shall be NRTL listed as suitable for the purpose and shall maintain the original fire rating of the penetrated floor, wall, etc.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

    a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 07 92 00 "Joint Sealants."
    b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work. Roof penetrations shall be avoided if at all possible.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 05 44

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.2 QUALITY ASSURANCE

A. Comply with ANSI A13.1

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.3 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field
2. Legend: Indicate voltage.

C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Colors for Raceways Carrying Circuits at 600 V and Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Single Conductor Control Wires: Identify with pre-printed sleeve type heat-shrink marker, with wire number, at each termination.

2.5 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

2.6 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following example legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.7 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.8 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic, or Melamine Label: Punched or drilled for screw mounting. White letters on a dark gray background. Minimum letter height shall be 3/8 inch.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Panelboard engraved labels shall be mechanically fastened using rivets or screws.

H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.

B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power.
2. Power.
3. UPS.

C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
b. Colors for 208/120-V Circuits:

1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.

c. Colors for 480/277-V Circuits:

1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.

d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

E. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.

F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

1. Limit use of underground-line warning tape to direct-buried cables.
2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

H. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:

    a. Power transfer switches.
    b. Controls with external control power connections.

J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

    a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high. Follow the Gulfstream panelboard labeling scheme.
    b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
    c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

    a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
    b. Enclosures and electrical cabinets.
    c. Access doors and panels for concealed electrical items.
    d. Switchboards.
    e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.

f. Emergency system boxes and enclosures.
g. Enclosed switches.
h. Enclosed circuit breakers.
i. Enclosed controllers.
j. Variable-speed controllers.
k. Power transfer equipment.
l. Power-generating units.
m. Monitoring and control equipment.

END OF SECTION 26 05 53

SECTION 26 09 23
LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following lighting control devices:

1. Photoelectric switches.
2. Indoor occupancy sensors.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 OUTDOOR PHOTOELECTRIC SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Industries, Inc.
2. Intermatic, Inc.
3. NSi Industries LLC; TORK Products.
4. Tyco Electronics; ALR Brand.

B. Description: Solid state, with SPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
3. Time Delay: Fifteen second minimum, to prevent false operation.
4. Surge Protection: Metal-oxide varistor.
5. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.

2.2 INDOOR OCCUPANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Lighting.
2. Leviton Mfg. Company Inc.
3. Lithonia Lighting; Acuity Lighting Group, Inc.
4. Sensor Switch, Inc.
5. TORK.
6. Watt Stopper (The).
7. N-Light

B. General Description: Wall- or ceiling-mounting, solid-state units with a separate relay unit.

1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
2. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
3. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
4. Mounting:

    a. Sensor: Suitable for mounting in any position on a standard outlet box.
    b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
    c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

5. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
6. Bypass Switch: Override the on function in case of sensor failure.
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keep lighting off when selected lighting level is present.

C. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.

1. Sensitivity Adjustment: Separate for each sensing technology.
2. Detector Sensitivity: Detect occurrences of 6-inch-minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch-high ceiling.

2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

A. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
3. Switch Rating: Not less than 800-VA fluorescent at 120 V, 1200-VA fluorescent at 277 V, and 800-W incandescent.

B. Wall-Switch Sensor:

1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 2100 sq. ft.
2. Sensing Technology: Dual technology - PIR and ultrasonic.
3. Switch Type: SP, field selectable automatic "on," or manual "on" automatic "off."
4. Voltage: Dual voltage, 120 and 277 V; dual-technology type.
5. Ambient-Light Override: Concealed, field-adjustable, light-level sensor from 10 to 150 fc. The switch prevents the lights from turning on when the light level is higher than the set point of the sensor.
6. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
7. Concealed "off" time-delay selector at 30 seconds, and 5, 10, and 20 minutes.
8. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.

2.4 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Division 26 Section "Conductors and Cables."

B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Division 26 Section "Conductors and Cables."

C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 16 AWG. Comply with requirements in Division 26 Section "Conductors and Cables."

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

A. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

B. When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

3.2 CONTACTOR INSTALLATION

A. Mount electrically held lighting contactors with elastomeric isolator pads, to eliminate structure-borne vibration, unless contactors are installed in an enclosure with factory-installed vibration isolators.

3.3 WIRING INSTALLATION

A. Wiring Method: Comply with Division 26 Section "Conductors and Cables." Minimum conduit size shall be 1/2 inch.

B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

C. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.4 IDENTIFICATION

A. Identify components and power and control wiring according to Division 26 Section "Electrical Identification."

1. Identify controlled circuits in lighting contactors.
2. Identify circuits or luminaries controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

3.5 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
2. Operational Test: Verify operation of each lighting control device, and adjust time delays.

B. Lighting control devices that fail tests and inspections are defective work.

END OF SECTION 26 09 23

SECTION 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. General-use and lighting branch-circuit panelboards.

1.2 SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Panelboard Schedules: For installation in panelboards.

C. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals.

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NEMA PB 1.

1.5 PROJECT CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

1.6 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.7 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year with extended warranties provided by manufacturers.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.

a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
b. Outdoor Locations: NEMA 250, Type 3R.
c. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
4. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
5. Finishes:

a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
b. Back Boxes: Same finish as panels and trim.
c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

6. Directory Card: Inside panelboard door, mounted in transparent card holder.

B. Incoming Mains Location: Top and bottom.

C. Phase, Neutral, and Ground Buses:

1. Material: Copper.
2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

D. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Copper.
2. Main and Neutral Lugs: Mechanical type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.
4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

E. Service Equipment Label: NRTL labeled for use as service equipment for panelboards or load centers with one or more main service disconnecting and overcurrent protective devices.

F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide

1. Square D; a brand of Schneider Electric.
2. Eaton Electrical Inc.; Cutler-Hammer.
3. General Electric Company
4. Siemens Energy & Automation, Inc.

B. Panelboards: NEMA PB 1, power and feeder distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

D. Mains: As indicated on Drawings.

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 GENERAL-USE AND LIGHTING BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide

1. Square D; a brand of Schneider Electric.
2. Eaton Electrical Inc.; Cutler-Hammer.
3. General Electric Company
4. Siemens Energy & Automation, Inc.

B. Panelboards: NEMA PB 1, branch-circuit type.

C. Mains: As indicated on Drawings.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide

1. Square D; a brand of Schneider Electric.
2. Eaton Electrical Inc.; Cutler-Hammer.
3. General Electric Company
4. Siemens Energy & Automation, Inc.

B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip, 100 percent rated circuit breakers shall be provided for circuit breaker frame sizes 400A and larger. Provide with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.

4. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
5. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
    d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    e. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
    f. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

C. Mount top of trim 90 inches above finished floor unless otherwise indicated.

D. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

E. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges per the coordination study.

F. Install filler plates in unused spaces.

G. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

H. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

I. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with a nameplate.

D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate.

3.4 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:

    a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
    b. Instruments and Equipment:

        1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values.

C. Panelboards will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 26 24 16

SECTION 26 27 13
ELECTRICITY METERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes electricity metering.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For electricity-metering equipment.

1. Include elevation views of front panels of control and indicating devices and control stations.
2. Include diagrams for power, signal, and control wiring.
3. Wire Termination Diagrams and Schedules: Include diagrams for power, signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features. Differentiate between manufacturer-installed and field-installed wiring.
4. Include series-combination rating data for modular meter centers with main disconnect device.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An NRTL.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metering equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Cost to repair or replace any parts for two years from date of Substantial Completion.

1.7 COORDINATION

A. Electrical Service Connections: Coordinate with utility companies and utility-furnished components.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 916.

2.2 UTILITY METERING INFRASTRUCTURE

A. Install metering accessories furnished by the utility company, complying with its requirements.

B. Utility-Furnished Meters: Connect data transmission facility of metering equipment installed by the Utility.

1. Data Transmission: Transmit pulse data over control-circuit conductors, classified as Class 1 per NFPA 70, Article 725. Comply with Section 26 05 23 "Control-Voltage Electrical Power Cables."

C. Current-Transformer Cabinets: Comply with requirements of electrical-power utility company.

D. Meter Sockets:

1. Comply with requirements of electrical-power utility company.
2. Meter Sockets: Steady-state and short-circuit current ratings shall meet indicated circuit ratings.

E. Arc-Flash Warning Labels:

1. Labels: Comply with requirements for "Arc-Flash Warning Labels" in Section 26 05 73.19 "Arc-Flash Hazard Analysis." Apply a properly sized self-adhesive label at each work location included in the analysis.
2. Labels: Comply with requirements for "Self-Adhesive Equipment Labels" and "Signs" in Section 26 05 53 "Identification for Electrical Systems." Apply a properly sized self-adhesive label for each work location included in the analysis. Labels shall be machine printed, with no field-applied markings.

a. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:

1) Location designation.
2) Nominal voltage.
3) Flash protection boundary.
4) Hazard risk category.
5) Incident energy.
6) Working distance.
7) Engineering report number, revision number, and issue date.

2.3 ELECTRICITY METERS

A. System Description: Able to meter designated activity loads, with or without external alarm, control, and communication capabilities, or other optional features.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ABB, Electrification Products Division.
2. Davidge Controls.
3. Eaton.
4. E-Mon.
5. GE Power; General Electric Company.
6. Leviton Manufacturing Co., Inc.
7. National Meter Industries.
8. Sensus Metering Systems.
9. Siemens Industry, Inc., Energy Management Division.
10. Square D; Schneider Electric USA.

C. Standard: Comply with ANSI C12.1 and ANSI C12.20, 0.5 accuracy class.

1. Ambient Temperature: Minus 22 deg F to plus 158 deg F.
2. Humidity: Zero to 95 percent, noncondensing.
3. Capacities and Characteristics:

a. Circuit: 120/240-V ac, 100 A.
b. Measure: kWh, onboard LED display.
c. Remote-Reading Options: None.

D. General Requirements for Meters:

1. Certify that meters comply with ANSI C12.20 requirements by a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology (NIST). The laboratory shall use test equipment that is certified annually and is traceable to NIST standards.
2. Enclosure: Supplied by meter manufacturer, NEMA 250, Type 1 minimum, with provisions for locking or sealing.
3. Identification: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."
4. Onboard Nonvolatile Data Storage: kWh, until reset.
5. Sensors: Current-sensing type, supplied by electronic meter manufacturer, with current or voltage output, selected for optimum range and accuracy for meters indicated for this application.

a. Type: Split and solid core, complying with recommendation of meter manufacturer.

E. Current-Transformer Cabinet: Size and configuration as recommended by metering equipment manufacturer for use with indicated connected feeder and sensors.

F. Data Transmission Cable: Comply with requirements in Section 26 05 23 "Control-Voltage Electrical Power Cables."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with equipment installation requirements in NECA 1.

B. Install meters furnished by utility company. Install raceways and equipment according to utility company's written instructions. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

C. Install modular meter center according to switchboard installation requirements in NECA 400.

D. Install arc-flash labels as required by NFPA 70.

E. Wiring Method:

1. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
2. Install unshielded, twisted-pair cable for control and signal transmission conductors, complying with Section 27 15 13 "Communications Copper Horizontal Cabling."
3. Minimum conduit size shall be 1/2 inch.

F. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections with the assistance of a factory-authorized service representative.

C. Tests and Inspections:

1. Equipment and Software Setup:

a. Set meter date and time clock.
b. Test, calibrate, and connect pulse metering system.
c. Set and verify billing demand interval for demand meters.
d. Report settings and calibration results.
e. Set up reporting and billing software, insert billing location names and initial constant values and variable needed for billing computations.

2. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
3. Turn off circuits supplied by metered feeder and secure them in off condition.
4. Run test load continuously for eight hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.
5. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.
6. Generate test report and billing for each tenant or activity from the meter reading tests.

D. Electricity metering will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION 26 27 13

SECTION 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard-grade receptacles, 125 V, 20 A.
2. USB receptacles.
3. GFCI receptacles, 125 V, 20 A.
4. Twist-locking receptacles.
5. Pendant cord-connector devices.
6. Cord and plug sets.
7. Toggle switches, 120/277 V, 20 A.
8. Wall-box dimmers.
9. Wall plates.
10. Floor service fittings.
11. Prefabricated multioutlet assemblies.
12. Service poles.

1.2 DEFINITIONS

A. AFCI: Arc-fault circuit interrupter.

B. BAS: Building automation system.

C. GFCI: Ground-fault circuit interrupter.

D. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

E. RFI: Radio-frequency interference.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Samples: One for each type of device and wall plate specified, in each color specified.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with requirements in this Section.

F. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

G. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Essential Electrical System: Red.

H. Wall Plate Color: For plastic covers, match device color.

I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Weather-Resistant Duplex Receptacle, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.3 USB RECEPTACLES

A. USB Charging Receptacles:

1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
2. USB Receptacles: Dual and quad, USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
3. Standards: Comply with UL 1310 and USB 3.0 devices.

2.4 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

2.5 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Receptacles, 120 V, 20 A:

1. Configuration: NEMA WD 6, Configuration L5-20R.
2. Standards: Comply with UL 498.

B. Twist-Lock, Single Receptacles, 250 V, 20 A:

1. Configuration: NEMA WD 6, Configuration L6-20R.
2. Standards: Comply with UL 498.

2.6 PENDANT CORD-CONNECTOR DEVICES

A. Description: Matching, locking-type plug and receptacle body connector, heavy-duty grade.

B. Configuration: NEMA WD 6, Configurations as shown on drawings.

C. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.

D. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

E. Standards: Comply with FS W-C-596.

2.7 CORD AND PLUG SETS

A. Match voltage and current ratings and number of conductors to requirements of equipment being connected.

B. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.

C. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.8 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:

1. Standards: Comply with UL 20 and FS W-S-896.

B. Two-Pole Switches, 120/277 V, 20 A:

1. Comply with UL 20 and FS W-S-896.

C. Three-Way Switches, 120/277 V, 20 A:

1. Comply with UL 20 and FS W-S-896.

2.9 DIMMERS

A. Wall-Box Dimmers:

1. Description: Modular, full-wave, solid-state dimmer switch with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
2. Control: Continuously adjustable slider; with single-pole or three-way switching.
3. Standards: Comply with UL 1472.
4. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.

    a. 600 W; dimmers shall require no derating when ganged with other devices.

5. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.
6. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.10 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: As selected by Architect.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant thermoplastic with lockable cover.

2.11 FLOOR SERVICE FITTINGS

A. Flush-Type Floor Service Fittings:

1. Description: Type: Modular, flush-type, dual-service units suitable for wiring method used, with cover flush with finished floor.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Service Plate and Cover: Rectangular, solid brass with satin finish.
4. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
5. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable.

2.12 PREFABRICATED MULTIOUTLET ASSEMBLIES

A. Description: Two-piece surface metal raceway, with factory-wired multioutlet harness.

B. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

C. Raceway Material: Metal, with manufacturer's standard finish.

D. Multioutlet Harness:

1. Receptacles: 15-A, 125-V, NEMA WD 6 Configuration 5-15R receptacles complying with NEMA WD 1, UL 498, and FS W-C-596.
2. Receptacle Spacing: as indicated on drawings.
3. Wiring: No. 12 AWG solid, Type THHN copper, single circuit.

2.13 SERVICE POLES

A. Dual-Channel Service Poles:

1. Description: Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
2. Poles: Nominal 2.5-inch- square cross-section, with height adequate to extend from floor to at least 6 inches above ceiling, and with separate channels for power wiring and voice and data communication cabling.
3. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
4. Material: Aluminum.
5. Finishes: Manufacturer's standard painted finish and trim combination.
6. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, balanced twisted pair data communication cables.
7. Power Receptacles: Two duplex, 20-A, straight-blade receptacles complying with requirements in this Section.
8. Data Communication Outlets: Four RJ-45 jacks.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 26 05 53 "Identification for Electrical Systems."

B. Essential Electrical System: Mark receptacles supplied from the essential electrical system to allow easy identification using a self-adhesive label.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

E. Wiring device will be considered defective if it does not pass tests and inspections.

END OF SECTION 26 27 26

SECTION 26 28 13
FUSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 600-V ac and less for use in enclosed switches.

1.2 QUALITY ASSURANCE

A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

1.3 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.4 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussmann, Inc.
2. Ferraz Shawmut, Inc.
3. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Motor Branch Circuits: Class RK5, time delay.

B. Other Branch Circuits: Class RK5, time delay.

C. Control Circuits: Class CC, time delay.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 26 28 13

SECTION 26 41 13
LIGHTNING PROTECTION FOR STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes lightning protection system for ordinary structures.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include layouts of the lightning protection system, with details of the components to be used in the installation.
2. Include raceway locations needed for the installation of conductors.
3. Details of air terminals, ground rods, ground rings, conductor supports, splices, and terminations, including concealment requirements.
4. Include roof attachment details, coordinated with roof installation.
5. Calculations required by NFPA 780 for bonding of metal bodies.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Lightning protection system Shop Drawings, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Lightning protection cabling attachments to roofing systems and accessories.
2. Lightning protection strike termination device attachment to roofing systems, coordinated with the roofing system manufacturer.
3. Lightning protection system components penetrating roofing and moisture protection systems and system components, coordinated with the roofing system manufacturer.

B. Qualification Data: For Installer.

C. Product Certificates: For each type of roof adhesive for attaching the roof-mounted air terminal assemblies, approved by the roofing-material manufacturer.

D. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For lightning protection system to include in maintenance manuals.

1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

a. Dimensioned site plan showing dimensioned route of the ground rod locations. Comply with requirements of Section 01 78 39 "Project Record Documents."
b. A system testing and inspection record, listing the results of inspections and ground resistance tests, as recommended by NFPA 780, Annex D.

B. Completion Certificate:

1. UL Master Label Certificate.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: LPI Master Installer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advanced Lightning Technology, Ltd.
2. East Coast Lightning Equipment Inc.
3. ERICO International Corporation.
4. Harger Lightning & Grounding.
5. Heary Bros. Lightning Protection Co. Inc.
6. Independent Protection Co.
7. National Lightning Protection.
8. Preferred Lightning Protection.
9. Robbins Lightning, Inc.
10. Thompson Lightning Protection, Inc.

2.2 PERFORMANCE REQUIREMENTS

A. NFPA Lightning Protection Standard: Comply with NFPA 780 requirements for Class I buildings.

B. Lightning Protection Components, Devices, and Accessories: Listed and labeled by a qualified testing agency as complying with UL 96, and marked for intended location and application.

2.3 MATERIALS

A. Air Terminals:

1. Aluminum unless otherwise indicated.

B. Air Terminal Bracing:

1. Aluminum.

C. Class 1 Main Conductors:

1. Aluminum.

D. Ground Rods:

1. Material: Copper-clad steel.
2. Diameter: 3/4 inch.
3. Rods shall be not less than 120 inches long.

E. Conductor Splices and Connectors: Compression fittings that are installed with hydraulically operated tools, or exothermic welds, approved for use with the class type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install lightning protection components and systems according to UL 96A and NFPA 780.

B. Install conductors with direct paths from air terminals to ground connections. Avoid bends less than 90 degrees and 8 inches in radius and narrow loops.

C. Conceal conductors within normal view from exterior locations at grade within 200 feet of building. Comply with requirements for concealed systems in NFPA 780.

1. Roof penetrations required for down conductors and connections to structural-steel framework shall be made using listed through-roof fitting and connector assemblies with solid rods and appropriate roof flashings. Use materials approved by the roofing manufacturer for the purpose. Conform to the methods and materials required at roofing penetrations of the lightning protection components to ensure compatibility with the roofing specifications and warranty.
2. Install conduit where necessary to comply with conductor concealment requirements.
3. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.

3.2 CONNECTIONS

A. Aboveground concealed connections, and connections in earth or concrete, shall be done by exothermic welds or by high-compression fittings listed for the purpose.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3.3 CORROSION PROTECTION

A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.

B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:

1. Perform inspections as required to obtain a UL Master Label for system.

B. Prepare test and inspection reports and certificates.

END OF SECTION 26 41 13

SECTION 26 43 13
SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes field-mounted SPDs for low-voltage (120 to 600 V) power distribution and control equipment.

1.2 DEFINITIONS

A. Inominal: Nominal discharge current.

B. MCOV: Maximum continuous operating voltage.

C. Mode(s), also Modes of Protection: The pair of electrical connections where the VPR applies.

D. MOV: Metal-oxide varistor; an electronic component with a significant non-ohmic current-voltage characteristic.

E. OCPD: Overcurrent protective device.

F. SCCR: Short-circuit current rating.

G. SPD: Surge protective device.

H. VPR: Voltage protection rating.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Copy of UL Category Code VZCA certification, as a minimum, listing the tested values for VPRs, Inominal ratings, MCOVs, type designations, OCPD requirements, model numbers, system voltages, and modes of protection.

B. Field quality-control reports.

C. SPD manufacturer shall provide UL 4th Edition documentations as part of the submittal.

D. Sample Warranty: Manufacturer's warranty statement.

E. Maintenance Data: For SPDs to include in maintenance manuals.

1.4 PROJECT CONDITIONS

A. Service Conditions: Rate SPD devices for continuous operation under the following conditions unless otherwise indicated:

1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.

2. Operating Temperature: 30 to 120 deg F.
3. Humidity: 0 to 85 percent, noncondensing.
4. Altitude: Less than 20,000 feet above sea level.

1.5 COORDINATION

A. Coordinate location of field-mounted SPD devices to allow adequate clearances for maintenance.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to replace or replace SPDs that fail in materials or workmanship within specified warranty period. Warranty shall cover unlimited replacement of SPD modules during the warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL SPD REQUIREMENTS

A. SPD with Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with UL 1449 4th edition.

D. Comply with NFPA 780 & UL96A Lighting Protection System Master Label.

E. MCOV of the SPD shall be the nominal system voltage.

2.2 SERVICE ENTRANCE OR TRANSFER SWITCH SUPPRESSOR

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by one of the following:

1. LEA International.
2. PQ Protection.
3. Advanced Protection Technologies Inc (APT).

B. SPDs: Comply with UL 1449, Type 1.

1. SPDs shall have the following features and accessories:

a. Integral disconnect switch.
b. Modular design (with field replaceable modules redundant per phase and redundant per mode).
c. SPD's shall be mounted external to the panel; internally mounted SPD's are not acceptable.
d. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
e. Indicator light display for protection status.

f. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status.
g. Surge counter.
h. Audible alarm, with silencing switch to indicate when protection has failed.

C. Comply with UL 1283.

D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 300 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

E. Protection modes and UL 1449 VPR (clamping voltage) for grounded wye circuits with 480Y/277 V or 208Y/120 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 1200 V for 480Y/277 V or 800 V for 208Y/120 V.
2. Line to Ground: 1200 V for 480Y/277 V or 1200 V for 208Y/120 V.
3. Line to Line: 2000 V for 480Y/277 V or 1000 V for 208Y/120 V.

F. Protection modes and UL 1449 VPR for 240/120 V, single-phase, three-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V.
2. Line to Ground: 1000 V.
3. Line to Line: 1000 V.

G. SCCR: Equal or exceed 200 kA.

H. Inominal Rating: 20 kA.

2.3 PANEL SUPPRESSORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by one of the following:

1. LEA International.
2. PQ Protection.
3. Advanced Protection Technologies Inc (APT).

B. SPDs: Comply with UL 1449, Type 2.

1. SPDs shall have the following features and accessories:

a. Compact, non-modular design.
b. SPD's shall be mounted external to the panel; internally mounted SPD's are not acceptable.
c. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
d. Indicator light display for protection status.
e. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status.
f. Audible alarm, with silencing switch to indicate when protection has failed.

C. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than the following:

1. 100A – 400A branch panelboards: 100kA.
2. 600A – 1200A distribution panelboards: 200kA.
3. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

D. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277 V or 208Y/120 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 1200 V for 480Y/277 V or 800 V for 208Y/120 V.
2. Line to Ground: 1200 V for 480Y/277 V or 700 V for 208Y/120 V.
3. Neutral to Ground: 1200 V for 480Y/277 V or 700 V for 208Y/120 V.
4. Line to Line: 2000 V for 480Y/277 V or 1200 V for 208Y/120 V.

E. Protection modes and UL 1449 VPR for 240/120-V, single-phase, three-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V.
2. Line to Ground: 700 V.
3. Neutral to Ground: 700 V.
4. Line to Line: 1200 V.

F. SCCR: Equal or exceed 200 kA.

G. Inominal Rating: 20 kA.

2.4 ENCLOSURES

A. Indoor Enclosures: NEMA 250, Type 1.

B. Outdoor Enclosures: NEMA 250, Type 4.

2.5 CONDUCTORS AND CABLES

A. Power Wiring: Same size as SPD leads, complying with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

B. Class 2 Control Cables: Multiconductor cable with copper conductors not smaller than No. 18 AWG, complying with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cables: Multiconductor cable with copper conductors not smaller than No. 14 AWG, complying with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install an OCPD (sized per manufacturer's recommendation) as required to comply with the UL listing of the SPD.

C. Verify all voltages before connecting to avoid injury and damage to equipment.

D. The SPDs shall be installed external to switchboard, distribution panel, or branch panel.

E. Install SPDs with conductors between suppressor and points of attachment as short and straight as possible, and adjust circuit-breaker positions to achieve shortest and straightest leads. Do not splice and extend SPD leads unless specifically permitted by manufacturer. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.

F. Refer to manufacturer's installation manual for further details.

G. Use crimped connectors and splices only. Wire nuts are unacceptable.

H. Wiring:

1. Power Wiring: Comply with wiring methods in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
2. Controls: Comply with wiring methods in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Compare equipment nameplate data for compliance with Drawings and Specifications.
2. Inspect anchorage, alignment, grounding, and clearances.
3. Verify that electrical wiring installation complies with manufacturer's written installation requirements.

B. An SPD will be considered defective if it does not pass tests and inspections.

3.3 STARTUP SERVICE

A. Complete startup checks according to manufacturer's written instructions.

B. Do not perform insulation-resistance tests of the distribution wiring equipment with SPDs installed. Disconnect SPDs before conducting insulation-resistance tests, and reconnect them immediately after the testing is over.

C. Energize SPDs after power system has been energized, stabilized, and tested.

3.4 DEMONSTRATION

A. Train owner's maintenance personnel to operate and maintain SPDs.

END OF SECTION 26 43 13

SECTION 26 51 00
INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior lighting fixtures, lamps, ballasts, LEDs, and drivers.
2. Emergency lighting units.
3. Exit signs.
4. Lighting fixture supports.

1.2 DEFINITIONS

A. BF: Ballast factor.

B. CCT: Correlated color temperature.

C. CRI: Color-rendering index.

D. HID: High-intensity discharge.

E. LER: Luminaire efficacy rating.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.3 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Ballast, including BF.
3. Energy-efficiency data.
4. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.

B. Installation instructions.

C. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.4 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NFPA 70.

D. Energy Efficiency: Meet applicable requirements of the IECC/DOE Energy Code and ANSI/ASHRAE/IESNA 90.1-2010 Energy Standard.

1.5 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product indicated on Drawings

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.

C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.

D. Metal Parts: Free of burrs and sharp corners and edges.

E. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

G. Diffusers and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

    a. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
    b. UV stabilized.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:

a. "USE ONLY" and include specific lamp type.
b. Lamp diameter code (T-4, T-5, T-8, T-12, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
d. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.
e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
f. CCT and CRI for all luminaires.

2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS

A. General Requirements for Electronic Ballasts:

1. Comply with UL 935 and with ANSI C82.11.
2. Designed for type and quantity of lamps served.
3. Ballasts shall be designed for full light output unless another BF, dimmer, or bi-level control is indicated.
4. Sound Rating: Class A.
5. Total Harmonic Distortion Rating: Less than 10 percent.
6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
7. Operating Frequency: 42 kHz or higher.
8. Lamp Current Crest Factor: 1.7 or less.
9. BF: 0.88 or higher.
10. Power Factor: 0.95 or higher.

B. Luminaires controlled by occupancy sensors shall have programmed-start ballasts.

C. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type.

1. Dimming Range: 100 to 5 percent of rated lamp lumens.
2. Ballast Input Watts: Can be reduced to 20 percent of normal.
3. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
4. Control: Coordinate wiring from ballast to control device to ensure that the ballast, controller, and connecting wiring are compatible.

2.4 BALLASTS FOR COMPACT FLUORESCENT LAMPS

A. Description: Electronic-programmed rapid-start type, complying with UL 935 and with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:

1. Lamp end-of-life detection and shutdown circuit.
2. Automatic lamp starting after lamp replacement.
3. Sound Rating: Class A.
4. Total Harmonic Distortion Rating: Less than 20 percent.
5. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.

6. Operating Frequency: 20 kHz or higher.
7. Lamp Current Crest Factor: 1.7 or less.
8. BF: 0.95 or higher unless otherwise indicated.
9. Power Factor: 0.95 or higher.
10. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.

2.5 DRIVERS FOR LED FIXTURES

A. Electronic Driver for LED Fixtures: Comply with UL 1310 Class 2 requirements for dry and damp locations. Include the following features unless otherwise indicated:

1. Rated for 50,000 hours of life, unless otherwise noted.
2. Sound Rating: Class A.
3. Total Harmonic Distortion Rating: 20 percent or less.
4. Current Crest Factor: 1.5 or less.
5. 0-10V Dimming Standard (Step Dimming does not qualify).

2.6 EMERGENCY POWER UNIT

A. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.

1. Emergency Connection: Operate fluorescent lamp(s) or LEDs continuously at an output of 1400 lumens each. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
2. Nightlight Connection: Operate lamp or LEDs continuously.
3. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.

    a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
    b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

4. Battery: Sealed, maintenance-free, nickel-cadmium type.
5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
6. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.7 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. Operating at nominal voltage of 120 V ac or 277 V ac.
2. Lamps for AC Operation: LEDs; 50,000 hours minimum rated lamp life.
3. Self-Powered Exit Signs (Battery Type): Internal emergency power unit.

2.8 FLUORESCENT LAMPS

A. T8 rapid-start lamps, rated 32 W maximum, nominal length of 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 4100 K, and average rated life 20,000 hours unless otherwise indicated.

B. Compact Fluorescent Lamps: 4-Pin, CRI 80 (minimum), color temperature 4100 K, average rated life of 10,000 hours at three hours operation per start unless otherwise indicated.

1. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
2. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
3. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).

2.9 LED FIXTURES

A. Except as otherwise indicated, provide LED luminaires, of types and sizes indicated on fixture schedules.

B. Include the following features unless otherwise indicated:

1. Each Luminaire shall consist of an assembly that utilizes edge-lit LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
2. Luminaire optics shall consist of precision formed optical assembly with positively retained high grade acrylic lenses using laser precise micro-prism patterns to provide directional distribution.
3. Each luminaire shall be rated for a minimum operational life of 60,000 hours utilizing a minimum ambient temperature of (25°C).
4. Light Emitting Diodes tested under LM-80 Standards for a minimum of 12,000 hours.
5. Color Rendering Index (CRI) of 82 at a minimum (85 Typical).
6. Color temperature 3500 K, unless otherwise indicated.
7. Rated lumen maintenance at 84% lumen output for 60,000 hours, unless otherwise indicated.
8. Fixture efficacy of 92 Lumens/Watt, minimum.
9. Fixture depth shall be no greater than 4.75 inches.
10. 5 year luminaire warranty, minimum.
11. Photometry must comply with IESNA LM-79.
12. Luminaries shall be Design Lights Consortium Qualified.
13. The individual LEDs shall be constructed such that a catastrophic loss of the failure of one LED will not result in the loss of the entire luminaire.
14. Luminaire shall be constructed such that driver may be replaced or repaired without the replacement of the whole fixture.
15. Luminaries shall be UL 1598 and UL 2043 listed.

C. Technical Requirements

1. The luminaire shall not consume power in the off state.
2. Operation Voltage: The luminaire shall operate from a 50 HZ to 60 HZ AC line over a voltage ranging from 120 VAC to 277 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.
3. Power Factor: The luminaire shall have a power factor of 0.9 or greater.
4. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent.
5. Operational Performance: The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.

D. Thermal Management

1. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
2. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.
3. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.
4. The luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.

2.10 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

B. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

C. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

D. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.

E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lighting fixtures:

1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
2. Install lamps in each luminaire.

B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

C. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.

1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches from lighting fixture corners.
2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.

D. Suspended Lighting Fixture Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

3.2 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Identify light fixtures that are fed by an emergency generator with a label stating “EMERGENCY SERVICE”. Place label on the ballast near the wire terminations.

3.3 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to emergency power and retransfer to normal.

3.4 STARTUP SERVICE

A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

END OF SECTION 26 51 00

SECTION 26 56 00
EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior luminaires with LEDs and drivers.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. HID: High-intensity discharge.

D. LER: Luminaire efficacy rating.

E. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.3 SUBMITTALS

A. Product Data: For each luminaire and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.

1.4 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with IEEE C2, "National Electrical Safety Code."

D. Comply with NFPA 70.

E. Energy Efficiency: Meet applicable requirements of the IECC/DOE Energy Code and ANSI/ASHRAE/IESNA 90.1-2010 Energy Standard.

1.5 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: One year with extended warranties provided by manufacturers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

1. LER Tests Fluorescent Fixtures: Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
2. LER Tests HID Fixtures: Where LER is specified, test according to NEMA LE 5B.

B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.

2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

    a. Color: As selected by Architect from manufacturer's full range.

N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

    a. Color: As selected by Architect from manufacturer’s full range.

O. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:

    a. "USES ONLY" and include specific lamp type.
    b. Lamp diameter code (T-4, T-5, T-8, T-12), tube configuration (twin, quad, triple), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
    c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
    d. Start type (preheat, rapid start, instant start) for fluorescent and compact fluorescent luminaires.
    e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
    f. CCT and CRI for all luminaires.

2.3 LED LUMINAIRES

A. General: Except as otherwise indicated, provide LED luminaires, of types and sizes indicated on fixture schedules.

B. Material and specifications for each luminaire are as follows:

1. Each Luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
2. Each luminaire shall be rated for a minimum operational life of 50,000 hours at an average operating time of 11.5 hours per night at 40ºC (104ºF).
3. The rated operating temperature range shall be -30°C (-22ºF) to +40°C (104ºF).
4. Each luminaire is capable of operating above 104°F (40°C), but not expected to comply with photometric requirements at elevated temperatures.
5. Photometry must be compliant with IESNA LM-79 and shall be conducted at 25°C ambient temperature.
6. Each luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average nighttime temperature.
7. The individual LEDs shall be constructed such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
8. Luminare shall be constructed such that LED modules may be replaced or repaired without replacement of whole luminaire.
9. Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL1598 for luminaires, or an approved equivalent standard from a nationally recognized testing laboratory.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Install lamps in each luminaire.

B. Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming.

3.2 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 26 05 33 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.3 GROUNDING

A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding."

1. Install grounding electrode for each pole unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

3.4 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

1. Verify operation of photoelectric controls.

END OF SECTION 26 56 00

SECTION 28 31 11
DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Remote annunciator.
7. Addressable interface device.
8. Digital alarm communicator transmitter.
9. Network communications.
10. System printer.

1.2 DEFINITIONS

A. EMT: Electrical Metallic Tubing.

B. FACP: Fire Alarm Control Panel.

C. NICET: National Institute for Certification in Engineering Technologies.

1.3 SUBMITTALS

A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.

11. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
12. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire-alarm system design.
b. NICET-certified, fire-alarm technician; Level IV minimum.

D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
3. Indicate audible appliances required to produce square wave signal per NFPA 72.

E. Qualification Data: For Installer.

F. Field quality-control reports.

G. Sample Warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
d. Riser diagram.
e. Device addresses.
f. Air-sampling system sample port locations and modeling program report showing layout meets performance criteria.
g. Record copy of site-specific software.

h. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:

1) Equipment tested.
2) Frequency of testing of installed components.
3) Frequency of inspection of installed components.
4) Requirements and recommendations related to results of maintenance.
5) Manufacturer's user training manuals.

i. Manufacturer's required maintenance related to system warranty requirements.
j. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.

C. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.

1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
2. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Noncoded, UL-certified addressable system, with multiplexed signal transmission and voice/strobe evacuation.

B. All components provided shall be listed for use with the selected system.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:

1. Manual stations.
2. Heat detectors.
3. Flame detectors.
4. Smoke detectors.
5. Duct smoke detectors.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances, including voice evacuation notices.
2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
5. Recall elevators to primary or alternate recall floors.
6. Activate elevator power shunt trip.
7. Activate emergency lighting control.
8. Record events in the system memory.
9. Record events by the system printer.
10. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. High- or low-air-pressure switch of a dry-pipe or preaction sprinkler system.
3. Elevator shunt-trip supervision.
4. User disabling of zones or individual devices.
5. Loss of communication with any panel on the network.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.
11. Hose cabinet door open.

2.3 FIRE-ALARM CONTROL UNIT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Notifier.
2. Simplex Grinnell
3. Silent Knight.
4. Edwards EST.

B. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.

    a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
    b. Include a real-time clock for time annotation of events on the event recorder and printer.
    c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
    d. The FACP shall be listed for connection to a central-station signaling system service.
    e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.

2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.

C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1. Pathway Class Designations: NFPA 72, Class B.
2. Notification Appliance Circuits: Style W.
3. Signaling Line Circuits: Style 4.
4. Pathway Survivability: Level 2.
5. Install number of addressable devices as per recommendations/requirements from system supplier
6. Serial Interfaces:

    a. One dedicated RS 485 port for central-station operation using point ID DACT.
    b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
    c. One USB port for PC configuration.
    d. One RS 232 port for VESDA HLI connection.
    e. One RS 232 port for voice evacuation interface.

E. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.

2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

F. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

G. Elevator Recall:

1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:

    a. Elevator lobby detectors except the lobby detector on the designated floor.
    b. Smoke detectors in elevator hoistway.

2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
3. Water-flow alarm connected to sprinkler in an elevator shaft shall shut down elevators associated with the location without time delay.

    a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

H. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of fire-alarm control unit.

1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.

    a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
    b. Programmable tone and message sequence selection.
    c. Standard digitally recorded messages for "Evacuation" and "All Clear."
    d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.

I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

J. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

K. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals, and digital alarm communicator transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

L. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: Sealed lead calcium.

M. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.4 MANUAL FIRE-ALARM BOXES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Notifier.
2. Silent Knight.
3. SimplexGrinnell LP.
4. System Sensor.

B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch.
3. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.5 SYSTEM SMOKE DETECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Fire-Lite Alarms.
2. Gentex Corporation.
3. Notifier.
4. Silent Knight.
5. SimplexGrinnell LP.
6. System Sensor.

B. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be four-wire type.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.

C. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

D. Ionization Smoke Detector:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

E. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.

4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 HEAT DETECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Fire-Lite Alarms.
2. Gentex Corporation.
3. Notifier.
4. Silent Knight.
5. SimplexGrinnell LP.
6. System Sensor.

B. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.

C. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.

1. Mounting: Adapter plate for outlet box mounting.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 NOTIFICATION APPLIANCES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Gentex Corporation.
2. SimplexGrinnell LP.
3. Notifier.
4. System Sensor.

B. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.

C. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

D. Chimes, Low-Level Output: Vibrating type, 75-dBA minimum rated output.

E. Chimes, High-Level Output: Vibrating type, 81-dBA minimum rated output.

F. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.

G. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.

1. Rated Light Output:

a. 15/30/75/110 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, white.

H. Voice/Tone Notification Appliances:

1. Comply with UL 1480.
2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
3. High-Range Units: Rated 2 to 15 W.
4. Low-Range Units: Rated 1 to 2 W.
5. Mounting: surface mounted and bidirectional.
6. Matching Transformers: Tap range matched to acoustical environment of speaker location.

I. Exit Marking Audible Notification Appliance:

1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
2. Provide exit marking audible notification appliances at the entrance to all building exits.
3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.8 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.

1. Mounting: Flush cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.9 ADDRESSABLE INTERFACE DEVICE

A. General:

1. Include address-setting means on the module.
2. Store an internal identifying code for control panel use to identify the module type.
3. Listed for controlling HVAC fan motor controllers.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

C. Integral Relay: Capable of providing a direct signal to circuit-breaker shunt trip for power shutdown.

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.
2. Operate solenoids for use in sprinkler service.

2.10 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.
3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply.
5. Loss of power.
6. Low battery.

7. Abnormal test signal.
8. Communication bus failure.

E. Secondary Power: Integral rechargeable battery and automatic charger.

F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.11 NETWORK COMMUNICATIONS

A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.

B. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.

C. Provide integration gateway using BACnet or Modbus for connection to building automation system.

2.12 SYSTEM PRINTER

A. Printer shall be listed and labeled as an integral part of fire-alarm system.

2.13 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by device manufacturer.
2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.

1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

1. Devices placed in service before all other trades have completed cleanup shall be replaced.

2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.

B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.

C. Manual Fire-Alarm Boxes:

1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
2. Mount manual fire-alarm box on a background of a contrasting color.
3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.

D. Smoke- or Heat-Detector Spacing:

1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
3. Smooth ceiling spacing shall not exceed 30 feet.
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A or Annex B in NFPA 72.
5. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.

E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.

F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.

1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

G. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.

H. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

I. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

J. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.

K. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.

1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.

B. Pathways shall be installed in EMT.

C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 08 71 00 "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
3. Smoke dampers in air ducts of designated HVAC duct systems.
4. Alarm-initiating connection to elevator recall system and components.
5. Alarm-initiating connection to activate emergency lighting control.
6. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
7. Supervisory connections at elevator shunt-trip breaker.
8. Data communication circuits for connection to building management system.

3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

   a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
   b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

D. Fire-alarm system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

F. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

G. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 28 31 11

DELRAY BEACH CRA DEVELOPMENT

95 SW 5TH AVE, DELRAY BEACH, FL 33444

S + A Project No. 18063

ARCHITECT:

SONG + ASSOCIATES, INC.
1545 CENTREPARK DRIVE NORTH
WEST PALM BEACH, FLORIDA 33401

CONSULTANTS:

CIVIL ENGINEER
MILLER LEGG
5747 N. ANDREWS WAY,
FORT LAUDERDALE, FL 33309

M.E.P. ENGINEER
OCI ASSOCIATES, INC
2 HAVARD CIRCLE
WEST PALM BEACH, FL 33409

宋
Song + Associates
Architecture • Planning • Interior Design

100% CONSTRUCTION DOCUMENTS
JANUARY 5TH, 2022

DELRAY BEACH CRA
COMMUNITY REDEVELOPMENT AGENCY

TO THE BEST OF MY KNOWLEDGE, THESE DRAWINGS AND THE PROJECT MANUAL ARE COMPLETE AND COMPLY WITH "THE FLORIDA BUILDING CODE", THE "FLORIDA FIRE PREVENTION CODE", AND OTHER APPLICABLE CODES AND REGULATIONS. AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH FBC CH. 105 AND 633 FLORIDA STATUTES.

Seal : STATE OF FLORIDA · ROBERT M. CASTROVINCI · AR98054 · REGISTERED ARCHITECT

Name : ROBERT M. CASTROVINCI
License # : AR98054

MATERIAL INDICATION

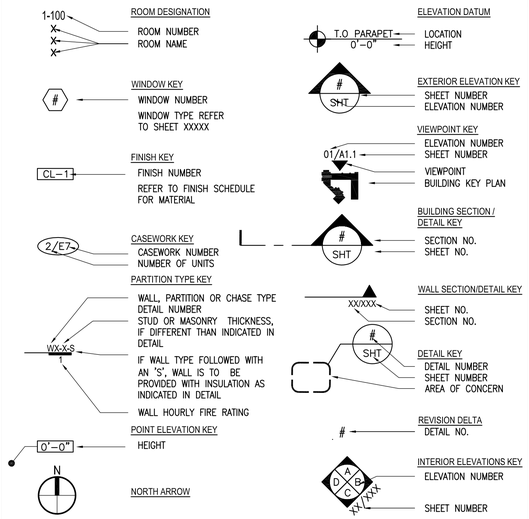
ELEVATION	SECTION	PLAN	
			EARTH FILL MATERIAL
			POROUS FILL (STONE, GRAVEL, ETC.)
			CAST IN PLACE CONCRETE
			PRECAST CONCRETE CAST STONE
			BRICK
			CONCRETE MASONRY UNIT (LARGE SCALE)
			CONCRETE MASONRY UNIT (SMALL SCALE)
			STEEL (LARGE SCALE)
			ALUMINUM (LARGE SCALE)
VARIES			STONE VENEER
			METAL (SMALL SCALE)
			ROUGH WOOD (CONTINUOUS)
			ROUGH WOOD (INTERMITTANT BLOCKING)
			WOOD (FINISHED)
			PLYWOOD (LARGE SCALE)
			PLYWOOD (SMALL SCALE)
			PARTICLE BOARD
			INSULATION (BATT)
			RIGID INSULATION (ROOF OR WALL)
			PLASTER, SAND, CEMENT, GROUT, GYPSUM BOARD
			MARBLE
			GLASS

ARCHITECTURAL ABBREVIATIONS

&	AND	±	PLUS OR MINUS
∠	ANGLE	℄	PLATE OR PROPERTY LINE
℄	CENTER LINE	□	SQUARE
ø	DIAMETER OR ROUND	C/C	CENTER TO CENTER
@	AT	#	POUND OR NUMBER

AC	AIR CONDITIONING	FDN	FOUNDATION	PLYWD	PLYWOOD
ACC	ACCESSIBLE	FHC	FIRE HOSE CABINET	POB	POINT OF BEGINNING
ACT	ACOUSTICAL CEILING TILE	FIN	FINISH	PREFAB	PREFABRICATED
AD	AREA DRAIN	F.F.	FINISH FLOOR	PSF	POUNDS PER SQUARE FOOT
ADJ	ADJUSTABLE	FLR	FLOOR	PSI	POUNDS PER SQUARE INCH
AFF	ABOVE FINISH FLOOR	FT	FEET / FOOT	PT	PRESSURE TREATED
A.L.	ARC LENGTH	GA	GAUGE	R	RISE
ALUM	ALUMINUM	GALV	GALVANIZED	RA	RETURN AIR
BD	BOARD	GEN	GENERAL	RAD/ R	RADIUS
BLDG	BUILDING	GL	GLASS	RD	ROOF DRAIN
BLK	BLOCK	GUM	GLASS UNIT MASONRY	REINF	REINFORCING
BM	BEAM	GWB	GYPSUM WALLBOARD	REQ'D	REQUIRED
BOB	BOTTOM OF BEAM	GYP	GYPSUM	RM	ROOM
BUR	BUILT-UP ROOF	H/HT	HEIGHT	SCHED	SCHEDULE
CIP	CAST IN PLACE	ID	INSIDE DIAMETER	SHT	SHEET
CJ	CONTROL JOINT	IN	INCH / INCHES	SIM	SIMILAR
CL	CHAIN LINK	INSUL	INSULATION	SP	SPACE
CLR	CLEAR	INT	INTERIOR	SPEC(S)	SPECIFICATION(S)
CLG	CEILING	JB	JOIST BEARING	STD	STANDARD
CMU	CONCRETE MASONRY UNIT	JT	JOINT	STL	STEEL
COL	COLUMN	MAX	MAXIMUM	SUSP	SUSPENDED
CONC	CONCRETE	MIN	MINIMUM	SW	SIDEWALK
CONT	CONTINUOUS/CONTINUE	MISC	MISCELLANEOUS	T	THICKNESS/TREAD
D	DEPTH	MO	MASONRY OPENING	TOB	TOP OF BEAM
DWG	DRAWING	MTL	METAL	TOC	TOP OF CONCRETE
EA	EACH	NIC	NOT IN CONTRACT	TOF	TOP OF FOOTING
EC	EASED CORNER	NO/ #	NUMBER	TOI	TOP OF INSULATION
EJ	EXPANSION JOINT	NTS	NOT TO SCALE	TOM	TOP OF MASONRY
ELEV	ELEVATION/ ELEVATOR	OH	OVERHEAD	TOP	TOP OF PARAPET
EQ	EQUAL	OC	ON CENTER	TOS	TOP OF SLAB
EQUIP	EQUIPMENT	OD	OUTSIDE DIAMETER	TOW	TOP OF WALL
EXP	EXPANSION	OPP	OPPOSITE	TYP	TYPICAL
EWC	ELECTRIC WATER COOLER	PLAS	PLASTER	UNO	UNLESS NOTED OTHERWISE
EXT	EXTERIOR			VERT	VERTICAL
FD	FLOOR DRAIN			VCT	VINYL COMPOSITION TILE
FE	FIRE EXTINGUISHER			W	WIDTH
FEC	FIRE EXTINGUISHER CABINET			W/	WITH
				WD	WOOD

SYMBOLS AND NOTES



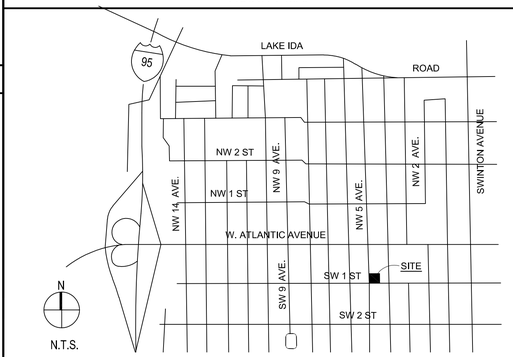
APPLICABLE CODES

TO THE BEST OF MY KNOWLEDGE, THESE DRAWINGS AND THE PROJECT MANUAL ARE COMPLETE AND COMPLY WITH THE "FLORIDA BUILDING CODE", THE "FLORIDA FIRE PREVENTION CODE", AND OTHER APPLICABLE CODES AND REGULATIONS.

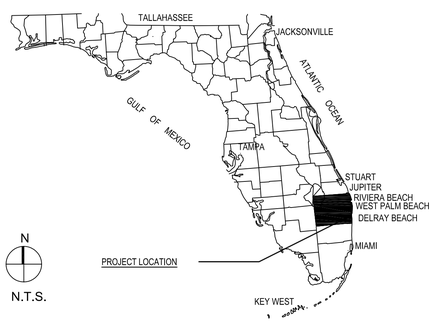
THE DESIGN AND CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS. SHOULD THERE BE A CONFLICT BETWEEN ANY CODE REQUIREMENTS, COMPLY WITH THE REQUIREMENT THAT PROVIDES THE GREATEST DEGREE OF LIFE SAFETY.

A. FBC (FLORIDA BUILDING CODE), 7th EDITION 2020.
   1. FBC – BUILDING
   2. FBC – ACCESSIBILITY
   3. FBC – ENERGY CONSERVATION
   4. FBC – MECHANICAL
   5. FBC – FUEL GAS
   6. FBC – PLUMBING
B. FLORIDA FIRE PREVENTION CODE, 6th EDITION 2017 INCLUDING:
C. NFPA 101–2018 EDITION LIFE SAFETY CODE
D. NEC (NATIONAL ELECTRICAL CODE) 2020

VICINITY MAP



LOCATION MAP



DRAWING INDEX

Sheet Number	Sheet Title	Issue Date	Rev. #	Rev. Date
GENERAL				
G-000	COVER	01-05-2022		
G-100	INDEX	01-05-2022	1	04-25-2022
SURVEY				
SH-1	TOPOGRAPHIC SURVEY	01-05-2022		
CIVIL				
C1.0	GENERAL NOTES & SPECIFICATIONS	01-05-2022		
C2.0	DEMOLITION PLAN	01-05-2022		
C3.0	GEOMETRY, MARKING, & SIGNAGE PLAN	01-05-2022		
C4.0	PAVING, GRADING & DRAINAGE PLAN	01-05-2022	1	02-25-2022
C4.1	GENERAL CONSTRUCTION DETAILS	01-05-2022	1	02-25-2022
C4.2	GENERAL CONSTRUCTION DETAILS	01-05-2022	1	02-25-2022
C4.3	TYPICAL SECTIONS	01-05-2022	1	02-25-2022
C5.0	UTILITY PLAN	01-05-2022	1	02-25-2022
C5.1	WATER AND SEWER DETAILS	01-05-2022	1	02-25-2022
C6.0	STORMWATER POLLUTION PREVENTION CONTROL	01-05-2022	1	02-25-2022
C6.1	STORMWATER POLLUTION PREVENTION DETAILS	01-05-2022	1	02-25-2022
LANDSCAPE				
LNP.1	LANDSCAPE PLAN	01-05-2022		
LNP.2	LANDSCAPE NOTES AND DETAILS	01-05-2022		
IRRIGATION				
IRR.1	IRRIGATION PLAN	01-05-2022		
IRR.2	IRRIGATION NOTES AND DETAILS	01-05-2022		
STRUCTURAL				
S01	GENERAL NOTES AND DESIGN INFORMATION	01-05-2022		
S10	FOUNDATION LAYOUT	01-05-2022		
S11	FOUNDATION DETAILS	01-05-2022		
S20	FLOOR FRAMING PLAN	01-05-2022		
S21	FLOOR SECTION AND DETAILS	01-05-2022		
S22	FLOOR SECTION AND DETAILS	01-05-2022		
S30	ROOF FRAMING PLAN	01-05-2022		
S31	ROOF SECTION AND DETAILS	01-05-2022		
ARCHITECTURE				
AD-100	SITE DEMO PLAN	01-05-2022		
AS1.0	CERTIFIED SITE PLAN (FOR REFERENCE ONLY)	11-29-2021		
A-100	SITE PLANS	01-05-2022		
A-150	SITE PLANS DETAILS	01-05-2022		
LS-100	LIFE SAFETY SITE PLANS	01-05-2022		
LS-200	LIFE SAFETY SUMMARY SHEET	01-05-2022		
LS-201	LIFE SAFETY FIRST FLOOR PLAN	01-05-2022		
LS-202	LIFE SAFETY SECOND FLOOR PLAN	01-05-2022	1	04-25-2022
A-201	FIRST FLOOR PLAN	01-05-2022		
A-202	SECOND FLOOR PLAN	01-05-2022		
A-250	ENLARGED RESTROOM FLOOR PLAN	01-05-2022		
A-301	FIRST FLOOR REFLECTED CEILING PLAN	01-05-2022		
A-302	SECOND FLOOR REFLECTED CEILING PLAN	01-05-2022		
A-401	ROOF PLANS	01-05-2022		
A-450	ROOF PLAN DETAILS	01-05-2022		
A-500	EXTERIOR ELEVATIONS	01-05-2022		
A-600	SECTIONS	01-05-2022		
A-601	WALL SECTIONS	01-05-2022		
A-620	STAIR AND ELEVATOR SECTIONS	01-05-2022		
A-800	DOORS & WINDOWS SCHEDULE AND TYPE	01-05-2022		
A-801	DOOR & WINDOW DETAILS	01-05-2022		
A-801	DOOR & WINDOW DETAILS	01-05-2022		
ID-211	INTERIOR FINISH PLANS AND SCHEDULE	01-05-2022		
MECHANICAL				
M-001	GENERAL HVAC NOTES	01-05-2022		
M-101	FIRST AND SECOND LEVEL FLOOR PLAN	01-05-2022		
M-102	ROOF PLAN HVAC	01-05-2022		
M-501	DETAILS HVAC	01-05-2022		
PLUMBING				
P-001	GENERAL NOTES PLUMBING	01-05-2022		
P-101	1ST & 2ND LEVEL FLOOR PLANS PLUMBING	01-05-2022		
P-102	ROOF PLAN PLUMBING	01-05-2022		
P-103	PLANS – PLUMBING	01-05-2022		
ELECTRICAL				
E-001	GENERAL NOTES AND SYMBOL LEGEND ELECTRICAL	01-05-2022		
E-101	FLOOR PLAN LIGHTING	01-05-2022		
E-101A	SITE PLAN PHOTOMETRICS	01-05-2022		
E-101B	EXISTING POST TOP PHOTOMETRICS	01-05-2022		
E-101C	STAIRWELL PHOTOMETRICS	01-05-2022		
E-101D	CUT SHEETS PHOTOMETRICS	01-05-2022		
E-103	ROOF PLAN ELECTRICAL	01-05-2022		
E-201	FLOOR PLAN POWER AND SYSTEMS	01-05-2022		
E-301	FLOOR PLAN FIRE ALARM	01-05-2022		
E-501	ONE-LINE DIAGRAM & PANEL SCHEDULE ELECTRICAL	01-05-2022		
E-601	ELECTRICAL DETAILS	01-05-2022		

GENERAL NOTES

FINAL PRODUCT APPROVAL SUBMITTALS WILL BE DEFERRED TO THE GENERAL CONTRACTOR AND SUBMITTED FOR ARCHITECT'S REVIEW BEFORE THE BUILDING DEPARTMENT'S FINAL ACCEPTANCE. ONLY AFTER THE BUILDING DEPARTMENT HAS AGREED TO THE SUBMITTALS SHALL THE PRODUCTS BE INSTALLED IN THE FIELD. THE GENERAL CONTRACTOR IS TO COORDINATE REVIEW TIME AND LEAD TIMES TO CONFORM WITH THE CONSTRUCTION SCHEDULE.

2

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — STATE OF FLORIDA — AR98054 — REGISTERED ARCHITECT

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 08-11-2022

CONSULTANTS:

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc., whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1 PERMIT COMMENTS 04-25-2022
2 PERMIT COMMENTS 08-10-2022

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
INDEX

Sheet # :
G-100

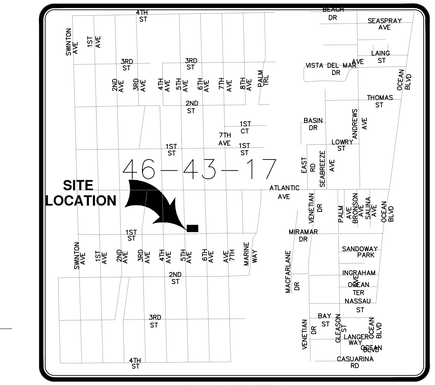
DESCRIPTION:

LOTS 28 AND 29, IN BLOCK 29, OF RE-SUBDIVISION OF BLOCKS 29 AND 37, DELRAY, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 9, AT PAGE 66, OF THE PUBLIC RECORDS OF PALM BEACH COUNTY, FLORIDA.

ADDRESS:

95 SW 5th AVENUE,
DELRAY BEACH, FL

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET



TOWNSHIP 46S - RANGE 43E - SECTION 17
LOCATION MAP
N.T.S.

DECORATIVE SIDEWALK PATTERN LEGEND:

- ORANGE PATTERN
- GREEN PATTERN
- BLACK PATTERN
- WHITE PATTERN

ABBREVIATIONS:

PG.	– PAGE
P.B.	– PLAT BOOK
P.B.C.R.	– PALM BEACH COUNTY RECORDS
EL.	– ELEVATION
INV.EL.	– INVERT ELEVATION
B.O.S.	– BOTTOM OF STRUCTURE
RCP	– REINFORCED CONCRETE PIPE
DIA.	– DIAMETER
A/C	– AIR CONDITIONING UNIT
℄	– PROPERTY LINE
℄	– CENTERLINE
(P)	– PLAT
(C)	– CALCULATED

SYMBOL LEGEND:

- POWER POLE
- FIRE HYDRANT
- WATER VALVE
- SANITARY SEWER MANHOLE
- CATCH BASIN
- BOLLARD
- STREET SIGN
- DRAINAGE MANHOLE
- WIRE PULL BOX
- GUY ANCHOR
- IRRIGATION CONTROL VALVE
- ELECTRIC SERVICE BOX
- HANDHOLE
- WATER METER
- TRASH CAN
- CURB INLET
- ELECTRIC METER
- CONCRETE UTILITY POLE
- OVHD OVERHEAD WIRE

UNDERGROUND UTILITY LEGEND:

- E E UNDERGROUND ELECTRIC LINE
- SWR SWR UNDERGROUND SEWER PIPE
- W W UNDERGROUND WATER LINE
- UNKN UNKNOWN UTILITY LINE

TRUNK DIAMETER IN INCHES
TREE LEGEND:
20"-15" OAK TREE
SILVER BUTTONWOOD TREE
CANOPY DIAMETER IN FEET

SURVEY NOTES:

1. THIS DOES NOT REPRESENT A BOUNDARY SURVEY.
2. LESSED OUT RIGHT OF WAY IN LEGAL DESCRIPTION SHOWN HEREON IS PER PALM BEACH COUNTY PROPERTY APPRAISER WEBSITE.
3. SUBJECT PROPERTY WAS NOT ABSTRACTED BY THIS FIRM FOR EASEMENT'S, RIGHT OF WAY, RESERVATIONS OR OTHER MATTERS OF RECORD, AND OWNERSHIP WAS NOT DETERMINED.
4. BURIED FOUNDATIONS WERE NOT LOCATED.
5. SCALE OF SOME FEATURES MAY BE EXAGGERATED FOR CLARITY
6. ELEVATIONS A RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988, SHOWN THUS: ±.55'
AND ARE BASED ON NGS POINT DESIGNATION 17.163, PID AD2695
DESCRIBED AS FOLLOWS:
BENCH MARK DISK SET IN THE ABUTMENT OR PIER OF A LARGE BRIDGE STAMPED 17.163, LOCATED 0.3 KM (0.2 MI) EASTERLY ALONG EAST ATLANTIC BOULEVARD (STATE HIGHWAY 806) FROM THE INTERSECTION OF NORTHEAST 6TH AVENUE (U.S. HIGHWAY 1) IN DELRAY BEACH, IN TOP OF AND 0.1 M (0.3 FT) WEST OF THE EAST END OF THE NORTH CONCRETE PIER OF THE LIFT SPAN OF THE BOULEVARD BRIDGE "SPANNING THE INTRACOASTAL WATERWAY, 7.7 M (25.3 FT) NORTH OF THE BOULEVARD CENTERLINE, 0.2 M (0.7 FT) ABOVE THE LEVEL OF THE BOULEVARD, AND 0.1 M (0.3 FT) SOUTH OF THE SOUTHEAST CORNER OF THE BRIDGE TENDERS OFFICE.
ELEVATION = 15.617' (NAVD88)
7. UTILITIES ARE DEPICTED PER A SUBSURFACE UTILITY INVESTIGATION CONDUCTED ON JANUARY 30 2019. INDUSTRY STANDARD GEOPHYSICAL PROSPECTING TECHNIQUES WERE USED IN CONJUNCTION WITH GROUND PENETRATING RADAR TO DETECT UNDERGROUND UTILITY LINES IN AREAS SPECIFIED BY THE CLIENT. DUE TO SITE CONDITIONS AND INHERENT LIMITATIONS WITH CURRENT TECHNOLOGY, NO GUARANTEE IS EXPRESSED THAT ALL UTILITIES WERE SUCCESSFULLY DETECTED AND LOCATED. CLIENT / CONTRACTOR IS HEREBY ADVISED TO CONTACT SUNSHINE STATE ONE CALL OF FLORIDA AT 811 PRIOR TO ANY EXCAVATION. MILLER LEGG SHALL NOT BE HELD LIABLE FOR DAMAGE CAUSED TO UTILITIES DURING CONSTRUCTION.

I HEREBY CERTIFY THAT THIS SURVEY MEETS STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.
DATED THIS 30th DAY OF JANUARY, 2019 A.D.

MARTIN P. ROSSI
PROFESSIONAL SURVEYOR AND MAPPER
STATE OF FLORIDA REGISTRATION No. 5857
NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

MARTIN P. ROSSI CERTIFICATE No. 5857 STATE OF FLORIDA Professional Surveyor & Mapper

NO.	DATE	REVISIONS	BY
	8/04/20	ADDED TO SHOW INVERTS ON 5th AVE AND REVISED TO SHOW NEW SURVEY	LP

95 SW 5th AVE
CITY OF DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

SKETCH OF TOPOGRAPHIC SURVEY

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2064
954-436-7000 / Fax: 954-436-8664
www.millerlegg.com

CERTIFICATES OF AUTHORIZATION:
EB7318 LB6680 LC0337

DES.	LP	MR
	DWN.	CHK.

PROJECT / FILE NO.
19-00014
DRAWING NO.
SH-1
DATE DRAWN:
2/1/19
SHT. 1 OF 1

V:\PROJECTS\2019\19-00014 - 95 SW 5TH AVE DEV. DELRAY CAN\DRAWINGS\SURVEY\19-00014_TS.DWG 1/5/20 by MONSHIE

GENERAL NOTES

GENERAL NOTES ON THE PROJECT PLANS AND DRAWINGS ARE SOLELY TO AID AND ASSIST THE CONTRACTOR WITH THE FIELD OPERATIONS FOR THE PROJECT. SAID GENERAL NOTES MAY NOT FULLY DESCRIBE ALL OF THE REQUIREMENTS FOR AN ITEM. THEREFORE, THE CONTRACTOR SHALL READ AND VERIFY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE PLANS, SPECIFICATIONS, GENERAL TERMS AND CONDITIONS, AND THE SUPPLEMENTAL TERMS AND CONDITIONS, TO FULLY UNDERSTAND AND COMPLY WITH ALL THE REQUIREMENTS THEREIN. THE LOCATION AND SIZE OF ALL EXISTING UTILITIES AND TOPOGRAPHY HAVE BEEN PREPARED FROM INFORMATION AVAILABLE TO THE ENGINEER. THIS INFORMATION IS NOT GUARANTEED AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF ANY EXISTING UTILITIES AND TOPOGRAPHY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL UTILITIES, BY ELECTRONIC METHODS AND BY HAND EXCAVATION IN COORDINATION WITH ALL UTILITY COMPANIES, PRIOR TO BEGINNING ANY CONSTRUCTION OPERATIONS. THIS WORK BY THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.

1. APPLICABLE CODES
 1.1. GENERAL
  ALL CONSTRUCTION, MATERIALS AND TESTING SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF CITY OF DELRAY BEACH, PALM BEACH COUNTY AND ALL OTHER LOCAL AND NATIONAL CODES WHERE APPLICABLE. WHEN ANY OF THE GOVERNING REGULATORY AGENCY'S STANDARDS ARE IN CONFLICT, THE MORE STRINGENT OF THE TWO SHALL APPLY.
 1.2. CONSTRUCTION SAFETY
  ALL CONSTRUCTION SHALL BE DONE IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
 1.3. TRENCH SAFETY ACT
  CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLIANCE WITH THE STATE OF FLORIDA TRENCH SAFETY ACT.
 1.4. SURVEY DATA
  ALL ELEVATIONS ON THE PLANS OR REFERENCED IN THE SPECIFICATIONS UNLESS OTHERWISE NOTED, ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88').

2. PRECONSTRUCTION RESPONSIBILITIES
 2.1. THE CONTRACTOR SHALL OBTAIN A SUNSHINE STATE ONE CALL AT 811 CERTIFICATION NUMBER AT LEAST 48 HOURS PRIOR TO BEGINNING ANY EXCAVATION.
 2.2. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE SIZE, LOCATION, ELEVATION, AND MATERIAL OF ALL EXISTING UTILITIES WITHIN THE AREA OF CONSTRUCTION.
 2.3. EXISTING UTILITY LOCATIONS SHOWN ON THESE PLANS ARE APPROXIMATE. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING UTILITIES SHOWN OR FOR ANY EXISTING UTILITIES NOT SHOWN.
 2.4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY EXISTING UTILITIES FOR WHICH HE FAILS TO REQUEST LOCATIONS FROM THE UTILITY OWNER. HE IS RESPONSIBLE AS WELL FOR DAMAGE TO ANY EXISTING UTILITIES WHICH ARE PROPERLY LOCATED.
 2.5. CONTRACTOR SHALL OBTAIN AND KEEP COPIES OF ALL REQUIRED PERMITS ONSITE PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR WORK PERFORMED WITHOUT PERMITS.

3. INSPECTIONS
 3.1. THE CONTRACTOR SHALL NOTIFY CITY OF DELRAY BEACH, THE ENGINEER OF RECORD AND PALM BEACH COUNTY, IF APPLICABLE, AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION AND PRIOR TO THE INSPECTION OF THE FOLLOWING ITEMS:
  3.1.1. STORM DRAINAGE
  3.1.2. SANITARY SEWER
  3.1.3. WATER SYSTEM
  3.1.4. SUBGRADE – SUBMIT AND HAVE APPROVED DENSITIES PRIOR TO PLACEMENT OF ROCK
  3.1.5. LIMEROCK BASE – SUBMIT AND HAVE APPROVED DENSITIES AND AS–BUILTS PRIOR TO THE PLACEMENT OF ANY ASPHALT.
  3.1.6. ASPHALTIC CONCRETE
  3.1.7. FINAL INSPECTION
 3.2. ALL INSPECTIONS SHALL BE MADE BY CITY OF DELRAY BEACH. THE ENGINEER OF RECORD WILL PROVIDE GENERAL CONSTRUCTION OBSERVATION SERVICES.

4. SHOP DRAWINGS
 4.1. PRIOR TO THEIR CONSTRUCTION OR INSTALLATION, SHOP DRAWINGS SHALL BE SUBMITTED TO AND REVIEWED BY CITY OF DELRAY BEACH AND ENGINEER OF RECORD FOR SANITARY MANHOLES, CATCH BASINS, FIRE HYDRANTS, VALVES AND OTHER MECHANICAL/ELECTRICAL EQUIPMENT WITH ASSOCIATED STRUCTURES, INCLUDING ALL DATA, CATALOGUE LITERATURE SHALL BE SUBMITTED FOR WATER AND SEWER PIPES, FITTINGS, AND APPURTENANCES.
 4.2. PRIOR TO SUBMITTING SHOP DRAWINGS TO THE ENGINEER, THE CONTRACTOR SHALL REVIEW AND APPROVE THE DRAWINGS, AND SHALL NOTE IN RED ANY DEVIATIONS FROM THE ENGINEERS' PLANS OR SPECIFICATIONS.
 4.3. INDIVIDUAL SHOP DRAWINGS FOR ALL PRECAST STRUCTURES ARE REQUIRED. CATALOGUE LITERATURE WILL NOT BE ACCEPTED FOR PRECAST STRUCTURES.

5. TEMPORARY FACILITIES
 5.1. TEMPORARY UTILITIES
  IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY TO HIS EMPLOYEES AND SUBCONTRACTORS FOR THEIR USE DURING CONSTRUCTION.
 5.2. TRAFFIC REGULATION
  5.2.1. MAINTENANCE OF TRAFFIC IN THE PUBLIC RIGHT–OF–WAY SHALL BE IN ACCORDANCE WITH THE MUTCD.
  5.2.2. ALL OPEN TRENCHES AND HOLES ADJACENT TO ROADWAYS OR WALKWAYS SHALL BE PROPERLY MARKED AND BARRICADED TO ASSURE THE SAFETY OF BOTH VEHICULAR AND PEDESTRIAN TRAFFIC.
  5.2.3. NO TRENCHES OR HOLES NEAR WALKWAYS OR IN ROADWAYS OR THEIR SHOULDERS ARE TO BE LEFT OPEN DURING NIGHTTIME HOURS WITHOUT EXPRESS PERMISSION OF THE ENGINEER, CITY OF DELRAY BEACH AND LOCAL OR PALM BEACH COUNTY AUTHORITY.
  5.2.4. ALL CONSTRUCTION WITHIN FDOT RIGHT–OF–WAYS MUST CONFORM WITH FDOT SPECIFICATIONS, STANDARDS AND PERMIT REQUIREMENTS. NO WORK SHALL COMMENCE WITHIN FDOT RIGHT–OF–WAYS WITHOUT AN FDOT PERMIT. FULL LANE WIDTH RESTORATION TO MATCH EXISTING PAVEMENT SECTION IS REQUIRED IN ACCORDANCE WITH FDOT STANDARDS FOR PROPOSED WORK WITHIN FDOT RIGHT–OF–WAYS.
  5.2.5. CONTRACTOR SHALL PREPARE AND SUBMIT MAINTENANCE OF TRAFFIC PLAN (MOT) WHERE REQUIRED BY FEDERAL, STATE, COUNTY OR LOCAL AGENCIES HAVING JURISDICTION. CONTRACTOR SHALL OBTAIN ALL REQUIRED APPROVALS AND PERMITS ASSOCIATED WITH THE MOT'S. ALL MOT'S ARE TO BE ATSSA CERTIFIED.

6. PROJECT CLOSEOUT
 6.1. CLEANING OUT
  6.1.1. DURING CONSTRUCTION, THE PROJECT SITE AND ALL ADJACENT AREAS SHALL BE MAINTAINED IN A NEAT AND CLEAN MANNER. UPON FINAL CLEAN UP, THE PROJECT SITE SHALL BE LEFT CLEAR OF ALL SURPLUS MATERIAL OR TRASH. THE PAVED AREAS SHALL BE SWEPT BROOM CLEAN AS DIRECTED BY THE ENGINEER.
  6.1.2. THE CONTRACTOR SHALL RESTORE OR REPLACE, WHEN AND AS DIRECTED BY THE ENGINEER OR CITY OF DELRAY BEACH, ANY PUBLIC OR PRIVATE PROPERTY DAMAGED BY HIS WORK, EQUIPMENT, EMPLOYEES OR THOSE OF HIS SUBCONTRACTORS TO A CONDITION AT LEAST EQUAL TO THAT EXISTING IMMEDIATELY PRIOR TO THE BEGINNING OF OPERATIONS. TO THIS END, THE CONTRACTOR SHALL DO AS REQUIRED ALL NECESSARY HIGHWAY OR DRIVEWAY, WALK, IRRIGATION AND LANDSCAPING WORK. SUITABLE MATERIALS AND METHODS SHALL BE USED FOR SUCH RESTORATION.
  6.1.3. WHERE MATERIAL OR DEBRIS HAS WASHED OR FLOWED INTO OR BEEN PLACED IN WATER COURSES, DITCHES, DRAINS, CATCH BASINS, OR ELSEWHERE AS A RESULT OF THE CONTRACTOR'S OPERATIONS, SUCH MATERIAL OR DEBRIS SHALL BE REMOVED, SATISFACTORILY DISPOSED OF DURING PROGRESS OF WORK, AND THE AREA KEPT IN A CLEAN AND NEAT CONDITION AS DIRECTED BY THE ENGINEER.
  6.1.4. CONTRACTOR SHALL DISPOSE OF ALL SITE DEMOLITION IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.
 6.2. PROJECT RECORD DOCUMENTS
  6.2.1. THE CONTRACTOR SHALL MAINTAIN ACCURATE AND COMPLETE RECORDS OF WORK ITEMS COMPLETED.
  6.2.2. PRIOR TO THE PLACEMENT OF ANY ASPHALT OR CONCRETE PAVEMENT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER "AS–BUILT" PLANS SHOWING LIMEROCK BASE GRADES, AND ALL DRAINAGE, WATER AND SEWER IMPROVEMENTS. PAVING OPERATIONS SHALL NOT COMMENCE UNTIL THE ENGINEER AND THE APPROVING AGENCY HAS REVIEWED THE "AS–BUILTS".
  6.2.3. ALL REQUIRED DENSITY AND LBR TEST RESULTS FOR SUBGRADE SHALL BE PROVIDED TO THE ENGINEER AND CITY OF DELRAY BEACH PRIOR TO PLACING LIMEROCK BASE MATERIAL.
  6.2.4. ALL REQUIRED DENSITY AND LBR TEST RESULTS FOR LIMEROCK SHALL BE PROVIDED TO THE ENGINEER AND CITY OF DELRAY BEACH PRIOR TO PLACING ASPHALT.
  6.2.5. ALL "AS–BUILT" INFORMATION SUBMITTED TO THE ENGINEER SHALL BE SUFFICIENTLY ACCURATE, CLEAR AND LEGIBLE TO THE SATISFACTION OF THE ENGINEER THAT THE INFORMATION PROVIDED IS TRUE REPRESENTATION OF THE IMPROVEMENTS CONSTRUCTED.
  6.2.6. LAKE AS–BUILTS WILL BE CROSS SECTIONED SHOWING THE DESIGNED SECTION AS DASHED, AS–BUILT SECTION AS SOLID, AND HAVE THE TOP OF BANK REFERENCE TO THE LAKE MAINTENANCE EASEMENT. SPACING BETWEEN EACH CROSS–SECTION SHALL BE SUCH AS TO PROVIDE ENOUGH DATA TO DETERMINE IF THE LAKE WAS CONSTRUCTED AS DESIGNED.
  6.2.7. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD TWO COMPLETE SETS OF "AS–BUILT" CONSTRUCTION DRAWINGS. THESE DRAWINGS SHALL BE MARKED TO SHOW "RECORD DRAWING" OR "AS–BUILT" CONSTRUCTION CHANGES AND DIMENSIONED LOCATIONS AND ELEVATIONS OF ALL IMPROVEMENTS AND SHALL BE SIGNED AND SEALED BY A REGISTERED LAND SURVEYOR OR ENGINEER. FINAL AS–BUILT INFORMATION SHALL BE SUBMITTED ON AN AUTOCAD & PDF FORMAT AS DIRECTED BY THE ENGINEER.

7. DEWATERING PERMIT
 7.1. DEWATERING PERMIT IS NOT AVAILABLE FOR THE SITE DEVELOPMENT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A DEWATERING PERMIT.

8. UNSUITABLE MATERIAL REMOVAL AND DISPOSAL
 8.1. CONTRACTOR IS RESPONSIBLE FOR DETERMINATION/INVESTIGATION OF SUBSURFACE CONDITIONS. ALL UNSUITABLE MATERIAL SURFACE AND SUBSURFACE WITHIN AREAS OF CONSTRUCTION IS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. UNSUITABLE MATERIAL INCLUDES BUT IS NOT LIMITED TO: DEBRIS, ORGANICS/MUCK , AND PLASTIC MATERIAL. ALL UNSUITABLE MATERIAL REMOVED SHALL BE REPLACED WITH SUITABLE MATERIAL.

9. GEOTECHNICAL REQUIREMENTS
 9.1. CONTRACTOR IS RESPONSIBLE FOR DETERMINATION/INVESTIGATION OF SUBSURFACE CONDITIONS.

10. DEMOLITION NOTES
 10.1. PROPER SAFETY PRECAUTIONS SHALL BE TAKEN TO SEPARATE AREA OF DEMOLITION FROM SURROUNDING PROPERTY.
 10.2. ALL ASPHALT AND CURB SHALL BE SAWCUT AT THE LIMITS OF DEMOLITION PRIOR TO REMOVAL.
 10.3. ALL DEMOLITION TO BE PERFORMED IN A MANNER TO ELIMINATE HAZARDS TO PERSONS AND PROPERTY, MINIMIZE INTERFERENCE WITH USE OF ADJACENT AREAS, PROVIDE NON–DISRUPTION OF SERVICES PROVIDED BY EXISTING UTILITIES TO ADJACENT AREAS, AND TO PROVIDE FREE PASSAGE TO AND FROM ADJACENT AREAS OR STRUCTURES.
 10.4. PRIOR TO AND DURING DEMOLITION, CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN.
 10.5. DEBRIS RESULTING FROM DEMOLITION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF ON A DAILY BASIS. DISPOSAL OF DEBRIS SHALL BE IN COMPLIANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL PERMITS, RULES AND/OR REGULATIONS.
 10.6. HAZARDOUS MATERIALS, IF PRESENT, SHALL BE DEALT WITH IN A MANNER CONSISTENT WITH FEDERAL, STATE AND LOCAL REGULATIONS.
 10.7. UPON COMPLETION OF DEMOLITION, THE IS TO BE LEFT IN CLEAN CONDITION FREE OF DEBRIS.
 10.8. CONTRACTOR TO PROVIDE PROPER SEDIMENT CONTROL AND PROTECTION OF STORM WATER STRUCTURES, BOTH WITHIN AND OUTSIDE THE LIMITS OF DEMOLITION AND P/L, TO PREVENT DEPOSIT OF SEDIMENTS CONVEYED THROUGH RUNOFF. CONTRACTOR TO CLEAN AND REMOVE SEDIMENTS FROM ALL STRUCTURES AS NEEDED.
 10.9. EXISTING UTILITY INFORMATION IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING ALL UTILITIES SHOWN OR NOT SHOWN PRIOR TO DEMOLITION. CONTRACTOR SHALL HAVE ALL UTILITIES PROPERLY LOCATED PRIOR TO COMMENCEMENT OF DEMOLITION.
 10.10. BRICK AND GROUT ANY REMAINING HOLE OPENINGS IN EXISTING STRUCTURES AFTER REMOVAL OF ANY PIPE DESIGNATED FOR REMOVAL.

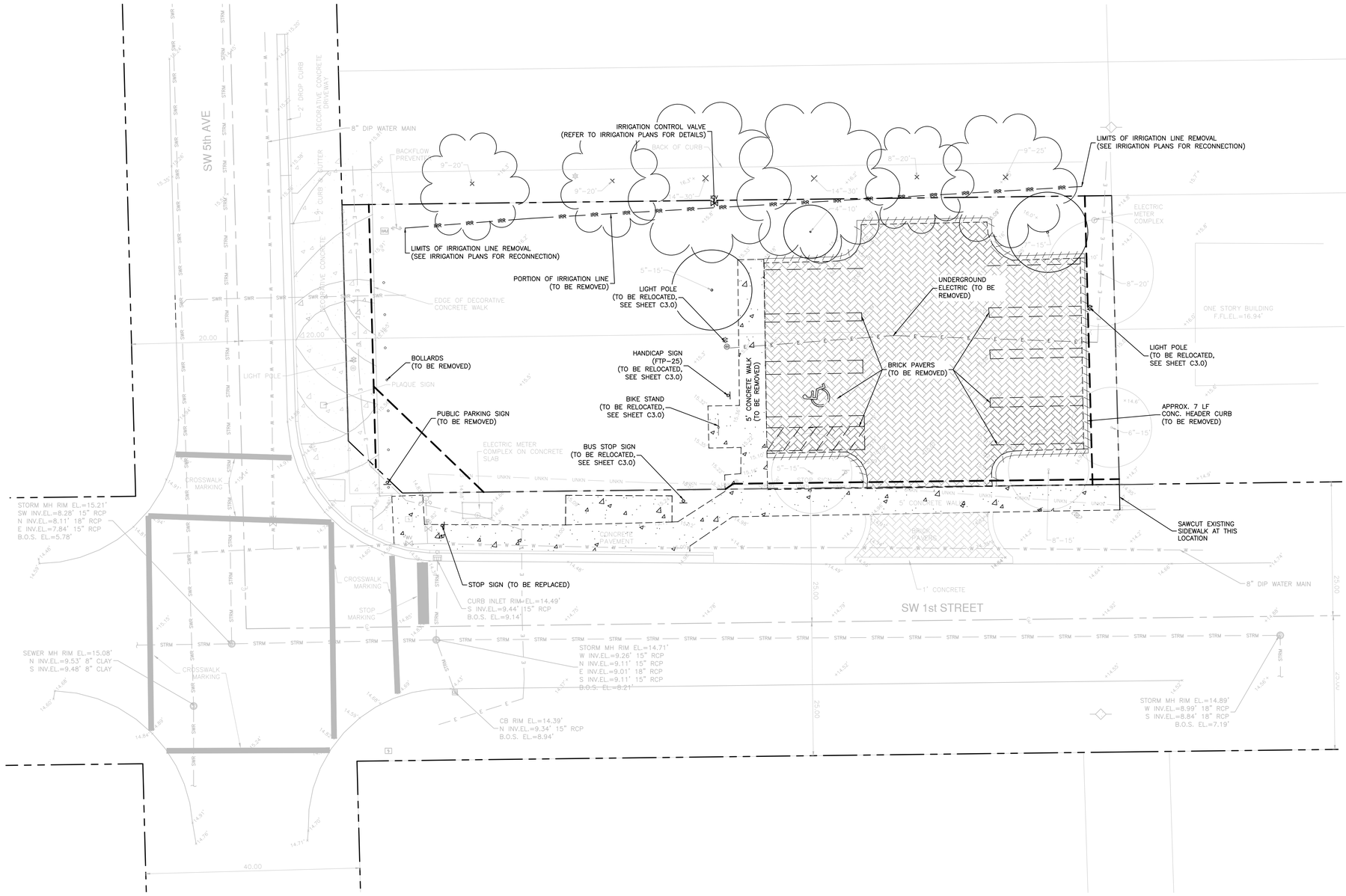
11. EARTHWORK
 11.3. GENERAL
  11.3.1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REQUEST A COPY OF THE GEOTECHNICAL ENGINEERING SOILS REPORT AND ADHERE TO THE CONDITIONS AND RECOMMENDATIONS STATED WITHIN.
  11.3.2. NONE OF THE EXISTING MATERIAL IS TO BE INCORPORATED IN THE LIMEROCK BASE.
  11.3.3. ALL SUB–GRADE UNDER PAVED AREAS SHALL HAVE A MINIMUM LBR VALUE OF 40 AND SHALL BE COMPACTED TO 98% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T–180.
  11.3.4. ALL FILL MATERIAL IN AREAS NOT TO BE PAVED SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T–180.
  11.3.5. A 2' BLANKET OF TOP SOIL SHALL BE PLACED OVER ALL AREAS TO BE SODDED.
 11.4. ON–SITE DISPOSAL
  11.4.1. ALL ORGANIC AND OTHER UNSUITABLE MATERIAL UNDER THOSE AREAS TO BE PAVED SHALL BE REMOVED TO A DEPTH OF THREE (3) FEET BELOW FINISHED GRADE AND FOR THREE (3) FEET BEYOND THE PERIMETER OF THE PAVING AND DISPOSED OF BY CONTRACTOR AS PART OF WORK.
  11.4.2. SUITABLE BACKFILL SHALL BE MINIMUM LBR 40 MATERIAL COMPACTED TO 98% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T–180 THREE (3) FEET BEYOND PERIMETER OF PAVING.
  11.4.3. ALL UNSUITABLE MATERIAL UNDER EXFILTRATION TRENCH LOCATIONS SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR AS PART OF THIS WORK.

12. STORM DRAINAGE
 12.1. CONTRACTOR MAY UTILIZE ONE OF THE FOLLOWING MATERIALS (AS DIRECTED AND APPROVED BY APPROVING AUTHORITY) ON A SIZE FOR SIZE BASIS:
  12.1.1. ALUMINUM
   12.1.1.1. PIPE SHALL BE ALUMINUM, MANUFACTURED IN CONFORMANCE WITH ASTM B–209. METAL PIPE SHALL NOT BE ALLOWED WITHIN THE ROAD RIGHT–OF–WAY.
   12.1.1.2. PIPE SHALL BE SPIRAL RIB DRAINAGE PIPE WITH 3/4" x 3/4" RIBS, APPROXIMATELY 1/2" ON CENTER. GAUGE THICKNESS SHALL MEET FDOT STANDARD 945–1.
   12.1.1.3. PIPE COUPLING BANDS SHALL BE 12" WIDE STANDARD SPLIT BANDS OF THE SAME ALLOY AS THE PIPE AND MAY BE ONE GAUGE LIGHTER THAN THE PIPE.
   12.1.1.4. POLYURETHANE OR OTHER SEALANT SHALL BE USED WITH COUPLING BANDS ON ALL NON–PERFORATED PIPE.
   12.1.1.5. CONTECH ULTRA–FLO
  12.1.2. REINFORCED CONCRETE (RCP)
   12.1.2.1. REQUIREMENTS OF SECTION 449 OF THE FDOT STANDARD SPECIFICATIONS. ALL REINFORCED CONCRETE PIPE SHALL BE CLASS III WATER TIGHT AND CONFORM TO THE STANDARD SPECIFICATIONS
   12.1.2.2. JOINTS SHALL BE SMALL CONFINED O–RING TYPE GASKETS AS SPECIFIED IN SECTION 942–1 OF FDOT STANDARD SPECIFICATIONS AND ASTM C443–98.
   12.1.2.3. PRECAST CONCRETE MANHOLES AND CATCH BASINS SHALL MEET THE REQUIREMENTS OF ASTM SPECIFICATION C–478 AND 64T.
   12.1.2.4. CONCRETE FOR PRECAST MANHOLES AND CATCH BASINS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
   12.1.2.5. REINFORCING STEEL FOR MANHOLES AND CATCH BASINS SHALL CONFORM TO ASTM SPECIFICATION A–615 AND A–305, LATEST REVISION.
   12.1.2.6. ALL RE–BAR SPLICES IN CONCRETE STRUCTURES SHALL HAVE A MINIMUM LAP OF 24 BAR DIAMETERS.
   12.1.2.7. ALL JOINTS IN CONCRETE STRUCTURES SHALL BE FINISHED WATERTIGHT.
   12.1.2.8. ALL SPACES AROUND PIPING ENTERING OR LEAVING MANHOLES AND CATCH BASINS SHALL BE COMPLETELY FILLED WITH 2:1 CEMENT MORTAR.
   12.1.2.9. ALL CONCRETE PIPE SHALL HAVE MODIFIED TONGUE AND GROOVE JOINT AND HAVE RUBBER GASKETS, UNLESS OTHERWISE SPECIFIED.
  12.1.3. HIGH DENSITY POLYETHYLENE PIPE (HDPE)
   12.1.3.1. HIGH DENSITY POLYETHYLENE PIPE FOR STORM SEWERS SHALL CONFORM TO FDOT 948–2.
  12.1.4. POLYVINYL–CHLORIDE PIPE (PVC)
   12.1.4.1. POLYVINYL–CHLORIDE PIPE FOR STORM SEWERS SHALL CONFORM TO FDOT 948–1.
   12.1.4.2. CONTECH A2000 PVC
 12.2. CONCRETE PIPE FOR STORM DRAINAGE SYSTEMS SHALL CONFORM TO THE REQUIREMENTS OF CURRENT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, CURRENT EDITION, SECTION 430.
 12.3. BEDDING AND INITIAL BACKFILL OVER DRAINAGE PIPE SHALL BE SAND WITH NO ROCK LARGER THAN 3/4" & 2" DIAMETER, RESPECTIVELY.
 12.4. BACKFILL MATERIAL UNDER PAVED AREAS SHALL BE COMPACTED TO 98% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T–180.
 12.5. BACKFILL MATERIAL UNDER AREAS NOT TO BE PAVED SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T–180 (INCLUDES SWALE AREAS).
 12.6. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SILT SCREENERS IN CATCH BASINS AND AT LOCATIONS AS DIRECTED BY THE ENGINEER UNTIL FINAL ACCEPTANCE OCCURS.

13. FDEP GENERAL WATER NOTES
 13.1. ALL PIPE, PIPE FITTINGS, PIPE JOINT PACKING AND JOINTING MATERIALS, VALVES, FIRE HYDRANTS AND METERS INSTALLED SHALL CONFORM TO APPLICABLE AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS.
 13.2. ALL PUBLIC WATER SYSTEM COMPONENTS, EXCLUDING FIRE HYDRANTS, THAT WILL COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NSF INTERNATIONAL STANDARD 61 AS ADOPTED IN RULE 62–555.335, F.A.C., OR OTHER APPLICABLE STANDARDS, REGULATION OR REQUIREMENTS REFERENCED IN PARAGRAPH 62–333.320(3)(B), F.A.C.
 13.3. ALL PIPE AND PIPE FITTINGS INSTALLED SHALL BE COLOR CODED OR MARKED IN ACCORDANCE WITH SUBPARAGRAPH 62–555.320(21)(B)3, F.A.C., USING BLUE AS PREDOMINANT COLOR. (UNDERGROUND PLASTIC PIPE SHALL BE SOLID–WALL BLUE PIPE, SHALL HAVE A C–EXTRUDED BLUE EXTERNAL SKIN, OR SHALL BE WHITE OR BLACK PIPE WITH BLUE STRIPES INCORPORATED INTO OR ADDED TO THE OUTSIDE WALL AND UNDERGROUND METAL OR CONCRETE PIPE SHALL HAVE BLUE STRIPES APPLIED TO THE PIPEWALL. PIPE STRIPED DURING MANUFACTURING OF THE PIPE SHALL HAVE CONTINUOUS STRIPES THAT RUN PARALLEL TO THE AXIS OF THE PIPE, THAT ARE LOCATED AT NO GREATER THAN 90–DEGREE INTERVALS AROUND THE PIPE AND THAT WILL REMAIN INTACT DURING AND AFTER INSTALLATION OF THE PIPE. IF TAPE OR PAINT IS USED TO STRIPE PIPE DURING PIPE AND THAT IS LOCATED ALONG THE TOP OF THE PIPE; FOR PIPE WITH AN INTERNAL DIAMETER OF 24 INCHES OR GREATER, TAPE OR PAINT SHALL BE APPLIED IN CONTINUOUS LINES ALONG EACH SIDE OF THE PIPE AS WELL AS ALONG THE TOP OF THE PIPE. ABOVEGROUND PIPE SHALL BE PAINTED BLUE OR SHALL BE COLOR CODED OR MARKED LIKE UNDERGROUND PIPE.)
 13.4. NEW OR ALTERED WATER MAINS CONSTRUCTED OF POLYVINYL CHLORIDE PIPE SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH AWWA STANDARD C603 OR C605, RESPECTIVELY, AS INCORPORATED INTO RULE 62–555.330, F.A.C. AND ALL OTHER NEW OR ALTERED WATER MAINS SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH AWWA STANDARD C600 AS INCORPORATED INTO RULE 62–333.330.

14. FDEP GENERAL SEWER NOTES
 14.1. APPROPRIATE DEFLECTION TESTS ARE SPECIFIED FOR ALL FLEXIBLE PIPE. TESTING IS REQUIRED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL PIPE SYSTEM. TESTING REQUIREMENTS SPECIFY: 1) NO PIPE SHALL EXCEED A DEFLECTION OF 5% 2) USING A RIGID BALL OR MANDREL FOR THE DEFLECTION TEST WITH A DIAMETER NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER OR AVERAGE INSIDE DIAMETER OF THE PIPE, DEPENDING ON WHICH IS SPECIFIED IN THE ASTM SPECIFICATION, INCLUDING THE APPENDIX, TO WHICH THE PIPE IS MANUFACTURED, AND 3) PERFORMING THE TEST WITHOUT MECHANICAL PULLING DEVICES.
 14.2. LEAKAGE TESTS ARE SPECIFIED REQUIRING THAT: 1) THE LEAKAGE EXFILTRATION OR INFILTRATION DOES NOT EXCEED 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER DAY FOR ANY SECTION OF THE SYSTEM; 2) EXFILTRATION OR INFILTRATION TEST BE PERFORMED WITH A MINIMUM POSITIVE HEAD OF 2 FEET; AND 3) AIR TESTS, AS A MINIMUM, CONFORM TO THE TEST PROCEDURE DESCRIBED IN ASTM C924 FOR CONCRETE PIPE, ASTM F–1417 FOR PLASTIC PIPE, AND FOR OTHER MATERIALS APPROPRIATE TEST PROCEDURES.
 14.3. DESIGN REQUIRES THAT A BENCH BE PROVIDED ON EACH SIDE OF ANY MANHOLE CHANNEL WHEN THE PIPE DIAMETER(S) ARE LESS THAN THE MANHOLE DIAMETER AND THAT NO LATERAL SEWER, SERVICE CONNECTION, OR DROP MANHOLE PIPE DISCHARGES ONTO THE SURFACE OF THE BENCH.
 14.4. DESIGN REQUIRES: 1) MANHOLE LIFT HOLES AND GRADE ADJUSTMENT RINGS BE SEALED WITH NON–SHRINK MORTAR OR OTHER APPROPRIATE MATERIAL; 2) INLET AND OUTLET PIPES BE JOINED TO THE MANHOLE WITH A GASKETED FLEXIBLE WATERTIGHT CONNECTION OR ANOTHER WATERTIGHT CONNECTION ARRANGEMENT THAT ALLOWS DIFFERENTIAL SETTLEMENT OF THE PIPE AND MANHOLE WALL; AND 3) WATERTIGHT MANHOLE COVERS BE USED WHEREVER THE MANHOLE TOPS MAY BE FLOODED BY STREET RUNOFF OR HIGH WATERS.
 14.5. MANHOLE INSPECTION AND TESTING FOR WATERTIGHTNESS OR DAMAGE PRIOR TO PLACING INTO SERVICE AREA SPECIFIED. AIR TESTING, IF SPECIFIED FOR CONCRETE SEWER MANHOLES, CONFORMS TO THE TEST PROCEDURES DESCRIBED IN ASTM C–1244.
 14.6. SUITABLE COUPLINGS APPROVED BY THE ENGINEER AND COMPLYING WITH ASTM SPECIFICATIONS ARE REQUIRED FOR JOINING DISSIMILAR MATERIALS.

15. GENERAL WATER AND SEWER NOTES
 15.1. ALL APPLICABLE PERMITS MUST BE OBTAINED AND ALL APPLICABLE FEES AND CHARGES MUST BE PAID PRIOR TO COMMENCEMENT OF CONSTRUCTION.
 15.2. A PRE–CONSTRUCTION MEETING SHALL BE HELD WITH CITY OF DELRAY BEACH ATTENDED BY THE CONTRACTOR, ENGINEER AND OTHER INTERESTED PARTIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
 15.3. THE CONTRACTOR SHALL MAINTAIN AT ALL TIMES ON THE SITE, A CURRENT SET OF APPROVED CONSTRUCTION PLANS. THE PLANS SHALL BE MADE AVAILABLE TO THE MUNICIPALITY'S ENGINEER OR HIS DESIGNEE UPON REQUEST.
 15.4. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE APPROVED PLANS. APPROVAL OF PLANS BY THE MUNICIPALITY IN NO WAY IMPLIES VERIFICATION OF THE ACCURACY OF THOSE PLANS OR FEATURES DEPICTED THEREON. THE OWNER'S ENGINEER SHALL BRING TO THE ATTENTION OF THE MUNICIPALITY'S ENGINEER ANY DISCREPANCY IN, OR VARIATION FROM, THE APPROVED PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING AND NEWLY INSTALLED UTILITIES AND IMPROVEMENTS FROM DAMAGE, DISRUPTION OF SERVICE, OR DESTRUCTION AT ALL TIMES THROUGHOUT THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING SUCH MEASURES AS NECESSARY TO PROTECT THE HEALTH, SAFETY AND WELFARE OF THOSE PERSONS HAVING ACCESS TO THE WORK SITE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO SAFEGUARD ALL EXISTING STRUCTURES AND UTILITIES. ADDITIONAL UTILITIES MAY EXIST WHICH ARE NOT SHOWN ON THE PLANS. ANY AND ALL CONFLICTS WITH EXISTING UTILITIES SHALL BE REPORTED TO THE ENGINEER.
 15.5. THE CONTRACTOR SHALL INFORM THE MUNICIPALITY'S ENGINEER AT LEAST 48 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION AND/OR CONNECTING TO A MUNICIPAL FACILITY.
 15.6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SCHEDULING OF TESTING AND PAYMENT FOR, SUCH TESTS AS MAY BE DEEMED NECESSARY BY THE OWNER'S ENGINEER OR THE MUNICIPAL ENGINEER, AND AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.
 15.7. THE OWNER'S ENGINEER SHALL MAKE SUFFICIENT INSPECTIONS OF THE WORK TO ENABLE HIM TO CERTIFY THE INSTALLATION AS BEING IN CONFORMANCE WITH THE APPLICABLE STANDARDS AND SPECIFICATIONS.
 15.8. THE OWNER'S REPRESENTATIVE WILL INFORM THE CONTRACTOR WHEN TO BACK FILL THE WORK, AND WILL WITNESS ALL PRESSURE, BACTERIOLOGICAL AND INFILTRATION/EXFILTRATION TESTS.
 15.9. SANITARY SEWERS AND FORCE MAINS SHOULD CROSS UNDER WATER MAINS WHENEVER POSSIBLE. SANITARY SEWERS AND FORCE MAINS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAINS AND THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE WHENEVER POSSIBLE. WHERE SANITARY SEWERS OR FORCE MAINS MST CROSS A WATER MAIN WITH LESS THAN 18 INCHES VERTICAL DISTANCE, BOTH THE SEWER AND THE WATER MAIN SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE (DIP), MIN. CLASS 52 AT THE CROSSING. SUFFICIENT LENGTHS OF DIP MUST BE USED TO PROVIDE A MINIMUM SEPARATION OF 10 FEET BETWEEN ANY TWO JOINTS. ALL JOINTS ON THE SEWER AND THE WATER MAIN WITHIN 20 FEET OF THE CROSSING SHALL BE MECHANICALLY RESTRAINED. A MINIMUM VERTICAL CLEARANCE OF 12 INCHES MUST BE MAINTAINED AT ALL CROSSINGS. ALL CROSSINGS SHALL BE ARRANGED SO THAT THE SEWER PIPE AND THE WATER MAIN PIPE JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING (PIPES CENTERED ON THE CROSSING). WHERE A NEW PIPE CONFLICTS WITH AN EXISTING PIPE WITH LESS THAN 18 INCHES VERTICAL CLEARANCE, THE PIPE SHALL BE ARRANGED TO MEET THE CROSSING REQUIREMENTS ABOVE.
 15.10. A MINIMUM OF 10–FOOT HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN ANY TYPE OF SEWER AND WATER MAIN IN PARALLEL INSTALLATIONS WHENEVER POSSIBLE. IN CASES WHERE IT IS NOT POSSIBLE TO MAINTAIN A 10 FOOT HORIZONTAL SEPARATION, THE WATER MAIN MUST BE LAID IN A SEPARATE TRENCH ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER OR FORCE MAIN AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18



HORIZONTAL SCALE

0 5 10 20

(IN FEET)
1 INCH = 10 FEET

LEGEND:

- RIGHT OF WAY/PROPERTY LINE
- EXISTING CONCRETE SIDEWALK/SURFACE (TO REMAIN)
- EXISTING CONCRETE PAVERS (TO REMAIN)
- EXISTING STORM DRAINAGE LINE (TO REMAIN)
- EXISTING DRAINAGE CATCH BASIN/CURB INLET/MANHOLE (TO REMAIN)
- EXISTING SANITARY SEWER LINE (TO REMAIN)
- EXISTING SANITARY SEWER MANHOLE (TO REMAIN)
- EXISTING BURIED ELECTRIC LINE (TO REMAIN)
- EXISTING WIRING PULL BOX/ELECTRIC METER/UTILITY POLE (TO REMAIN)
- EXISTING WATER LINE (TO REMAIN)
- EXISTING IRRIGATION LINE (TO REMAIN)
- EXISTING BACKFLOW PREVENTER/WATER VALVE/WATER METER/IRRIGATION CONTROL VALVE/FIRE HYDRANT (TO REMAIN)
- EXISTING UNKNOWN UTILITY LINE (TO REMAIN)
- EXISTING BOLLARD/TRAFFIC SIGN/TRASH RECEPTACLE (TO REMAIN)
- EXISTING TREES (TO REMAIN)
- EXISTING CONCRETE SIDEWALK/SURFACE (TO BE REMOVED) (APPROX. 1065 SF)
- EXISTING CONCRETE PAVERS (TO BE REMOVED & REPLACED, SEE SHEET C3.0 FOR DETAILS) (APPROX. 390 SF)
- EXISTING ASPHALT PAVEMENT (TO BE REMOVED) (APPROX. 122 SF)
- EXISTING TYPE 'D' CURB (TO BE REMOVED) (APPROX. 75 LF)
- EXISTING TYPE 'F' CURB (TO BE REMOVED) (APPROX. 6 LF)
- EXISTING STRIPING (TO BE REMOVED VIA WATER BLASTING)
- EXISTING IRRIGATION LINE (TO BE REMOVED)
- EXISTING IRRIGATION CONTROL VALVE (TO BE REMOVED)
- EXISTING TRAFFIC SIGN/BIKE STAND/BOLLARD (TO BE REMOVED, SEE SHEET C3.0 FOR TRAFFIC SIGN AND BIKE STAND RELOCATION)
- EXISTING TREES (TO BE REMOVED, SEE LANDSCAPE PLANS FOR DETAILS)

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER

1/5/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

This item has been digitally signed and sealed by William E. Schipske, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

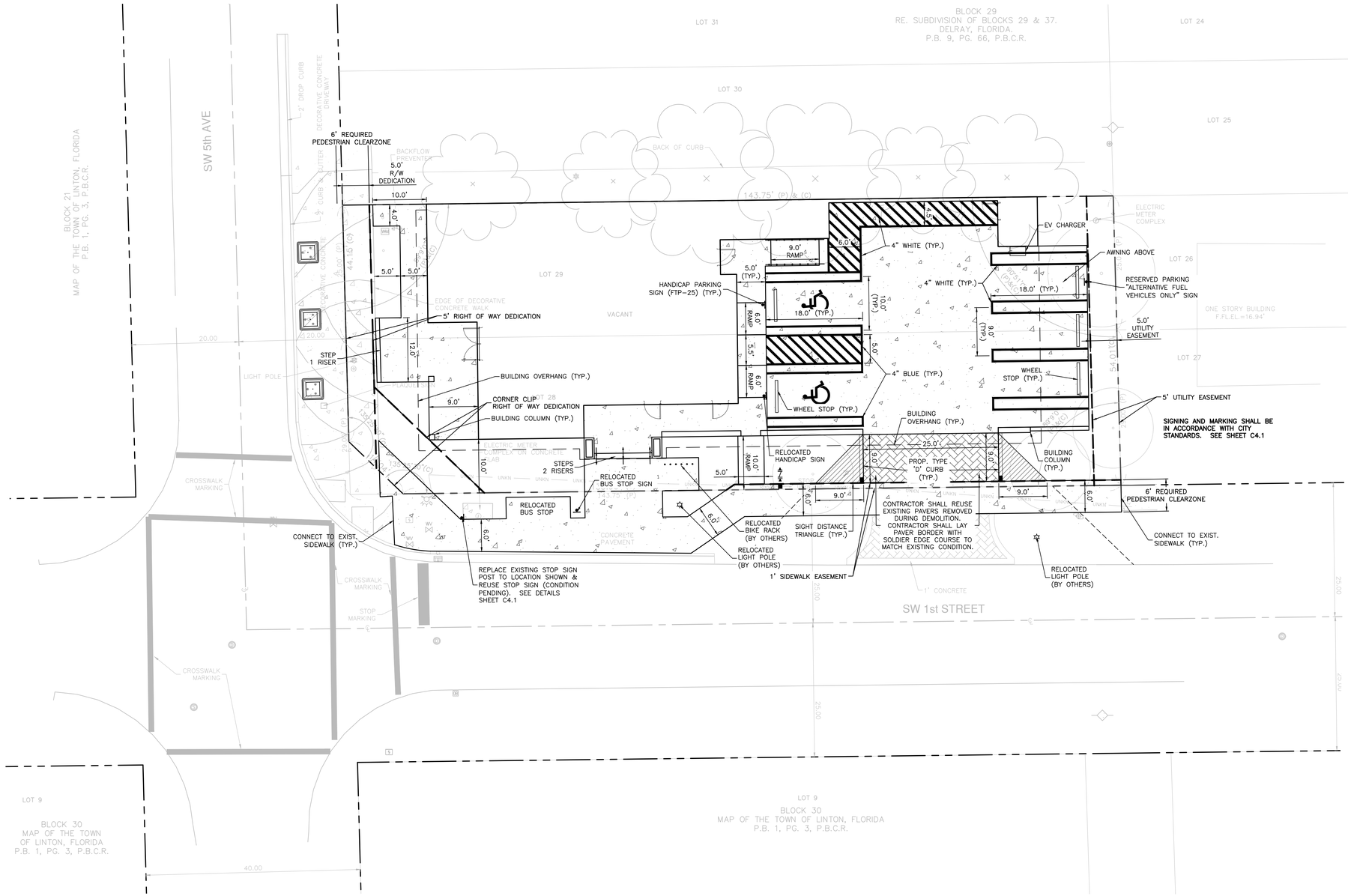
Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
DEMOLITION PLAN

Sheet # :
C2.0



HORIZONTAL SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

LEGEND:

- RIGHT OF WAY/PROPERTY LINE
- EXISTING CONCRETE SIDEWALK/SURFACE (TO REMAIN)
- EXISTING CONCRETE PAVERS (TO REMAIN)
- EXISTING DRAINAGE CATCH BASIN/CURB INLET/MANHOLE (TO REMAIN)
- EXISTING SANITARY SEWER MANHOLE (TO REMAIN)
- EXISTING WIRING PULL BOX/ELECTRIC METER/UTILITY POLE (TO REMAIN)
- EXISTING BACKFLOW PREVENTER/WATER VALVE/WATER METER/IRRIGATION CONTROL VALVE/FIRE HYDRANT (TO REMAIN)
- EXISTING BOLLARD/TRAFFIC SIGN/TRASH RECEPTACLE (TO REMAIN)
- EXISTING TREES (TO REMAIN)
- PROPOSED BUILDING
- PROPOSED HAND RAIL
- PROPOSED CONCRETE SIDEWALK/SURFACE (APPROX. 655 SF)
- PROPOSED ASPHALT RESTORATION (APPROX. 122 SF)
- PROPOSED CONCRETE SIDEWALK/SURFACE RESTORATION (APPROX. 120 SF)
- PROPOSED RELOCATED PAVERS (SEE SHEET C2.0) (APPROX. 70 SF)
- PROPOSED WATER METER/BACKFLOW PREVENTER

This item has been digitally signed and sealed by William E. Schipske, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER
1/5/2022
Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :
MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

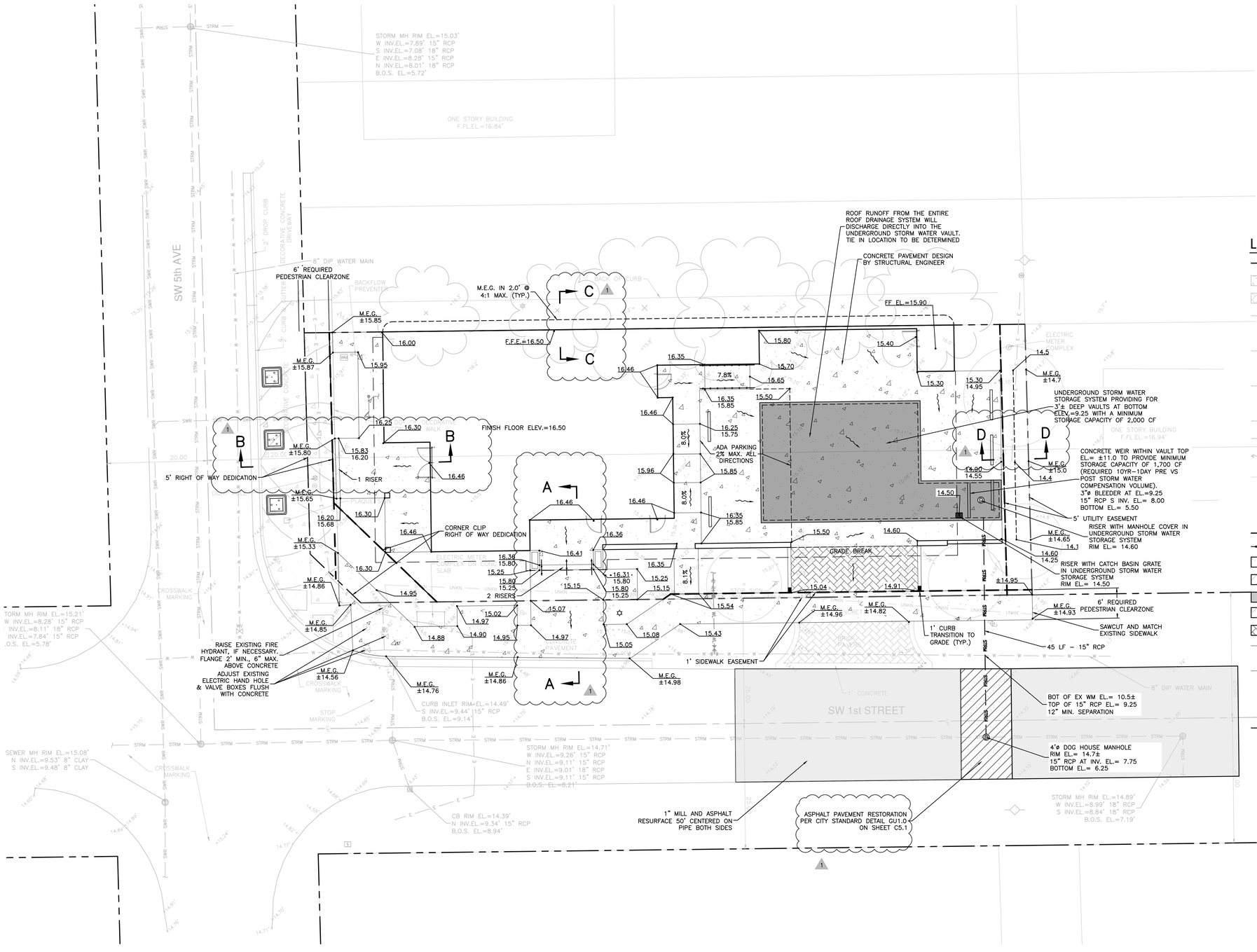
Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
GEOMETRY, MARKING & SIGNAGE PLAN

Sheet # :
C3.0



ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

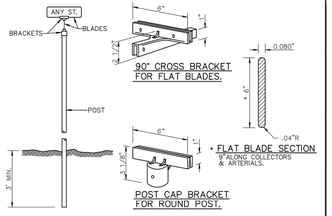
REV #1 02-25-22

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
PAVING, GRADING & DRAINAGE PLAN

Sheet # :
C4.0



GENERAL SPECIFICATIONS:

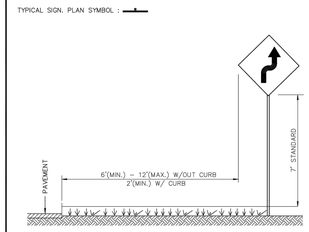
* BLADE: ALCOA NO.86054.6063–T6 ALLOY, ETCHED, DEGREASED, AND DEBURRED WITH NO.1200 ALDOLINE FINISH WITH HIGH INTENSITY GREEN BACKGROUND DIMENSIONS: 6" OR 9" IN HEIGHT, AND 24", 30", OR 36" IN LENGTH

* LETTERS: NAME 4" SERIES "B" HIGH INTENSITY (SILVER) SUFFIX 2" SERIES "B" HIGH INTENSITY (SILVER) ALL LETTERS FOR SIGNS ALONG COLLECTOR OR ARTERIAL ROADWAYS SHALL BE 7" SERIES "B" WITH 4" SERIES "B" SUFFIX ON 9" HIGH BLADES.

* POST: STEEL FLANGED GALVANIZED CHANNEL. PER A.S.T.M. A123 WITHOUT ANCHOR PLATES.

* BRACKETS: DIE CAST HIGH STRENGTH ALUMINUM ALLOY, MIN. TENSILE STRENGTH 45,000 P.S.I., DEGREASED, TUMBLED, AND POLISHED SIDES OF ALL SLOTS SHALL BE SOLID METAL WITH TWO HOLES PER SLOT (SAME SIDE) DRILLED TO 7/32" AND TAPPED TO 1/4" TO RECEIVE STAINLESS STEEL ALLENHEAD SET SCREWS, SKIRT OF POST CAP BRACKET TO BE DRILLED AND TAPPED FOR 3 SCREWS OF WHICH NO TWO IS TO BE LESS THAN 90° OR MORE THAN 135° APART. (METRO HUSKEY NO.6 OR EQUAL.)

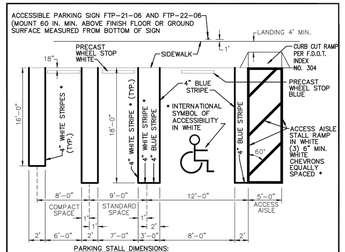
CITY of DELRAY BEACH | PUBLIC WORKS DEPARTMENT | 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444 | STREET SIGN DETAIL (SHEET 1 of 2) | DATE 08-15-2007 | RT 6.0



NOTES:

1. ALL SIGNS SHALL BE SPECIFIED USING THE M.U.T.C.D. DESIGNATION.
2. ALL SIGNS SHALL BE FACED WITH HIGH INTENSITY SHEETING MATERIAL OR BETTER.
3. SIGNS SHALL BE MANUFACTURED WITH 0.080" ALUMINUM BLANK.
4. POSTS SHALL BE PER DETAIL RT 6.0.
5. USE SHALL FOLLOW THE M.U.T.C.D. AND F.D.O.T. STANDARD DESIGN SPECIFICATIONS
6. ANY DEVIATION FROM THIS TYPICAL SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
7. REFLECTIVE POSTS MAY BE USED IF M.U.T.C.D. STANDARD IS FOLLOWED.

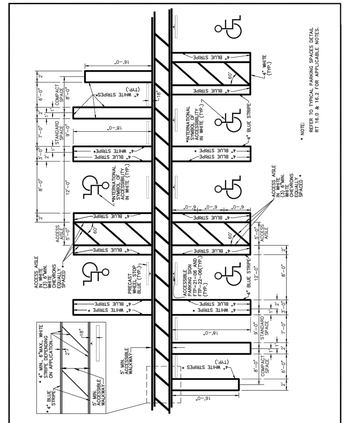
CITY of DELRAY BEACH | PUBLIC WORKS DEPARTMENT | 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444 | STREET SIGN DETAIL (SHEET 2 of 2) | DATE 08-15-2007 | RT 7.0



* NOTES:

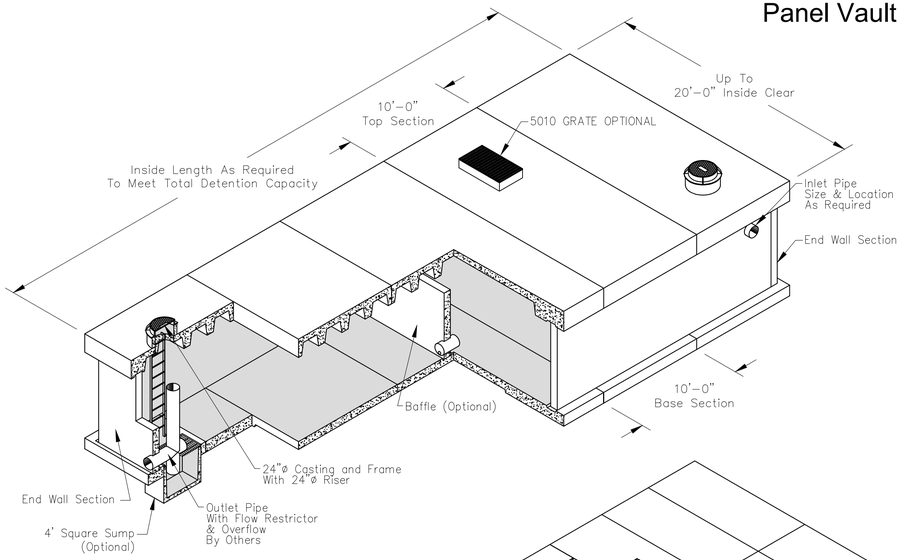
1. ON LIGHT COLORED SURFACE I.E. CONCRETE ALL ACCESSIBLE MARKINGS SHALL BE BLUE AND STANDARD PARKING STRIPING SHALL BE 3" WHITE WITH 1" BLACK BORDER.
2. ALL STRIPING WITHIN PUBLIC RIGHT–OF–WAY SHALL BE 6 INCHES.
3. ALL MEASUREMENTS ARE FROM CENTER LINE.
4. ALL COMPACT SPACES MUST HAVE "COMPACT" STENCILED WITH BLACK PAINT ON WHEEL STOP.
5. BLUE STRIPE AT INTERNATIONAL SYMBOL OF ACCESSIBILITY AND WALKWAY ON CONCRETE.
6. 24" STOP BAR BETWEEN ALL PARKING LOTS AND PUBLIC R/W SHALL BE THERMOPLASTIC AND PER FDOT SPECIFICATIONS AND STOP SIGN R1–1 THERMOPLASTIC AND PER FDOT SPECIFICATIONS AND STOP SIGN R1–1
7. CHANGES IN LEVEL ARE NOT PERMITTED IN ACCESSIBLE PARKING STALLS AND ACCESS AISLES SERVING THE STALLS. SLOPES NOT STEEPER THAN 1:48 SHALL BE PERMITTED.

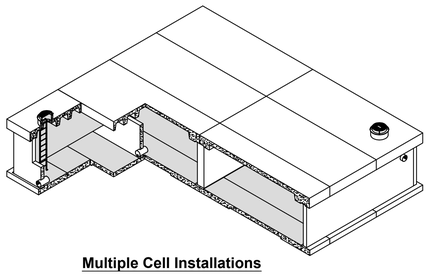
CITY of DELRAY BEACH | PUBLIC WORKS DEPARTMENT | 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444 | TYPICAL PARKING SPACES (1 OF 3) | DATE 08-15-2007 | RT 16.0


* NOTE: TO TYPICAL PARKING SPACE DETAIL RT 16.0 & 16.2 FOR APPLICABLE NOTES.
4" WHITE STRIPE
4" BLUE STRIPE
INTERNATIONAL SYMBOL OF ACCESSIBILITY IN WHITE
ACCESS AISLE STALL RAND IN WHITE (3) 6" MIN. WHITE CHEVRONS EQUALLY SPACED *
4" WHITE STRIPES * (TYP.)
4" WHITE STRIPE * (TYP.)
4" BLUE STRIPE
4" WHITE STRIPE
4" BLUE STRIPE
60°
3x8x0.5 317# ,J
3x8x0.5 313# ,J
(ALL)
4x28x0.5 314# ,J

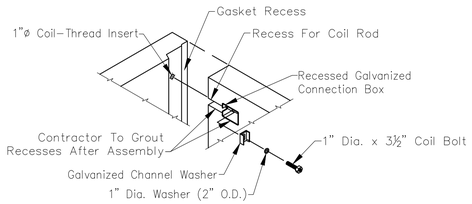
DETENTION VAULTS

Panel Vault System

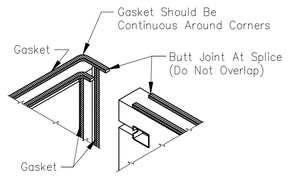




Multiple Cell Installations

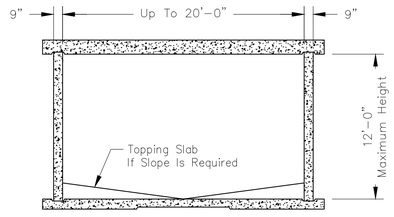


WALL CONNECTION DETAIL



GASKET INSTALLATION DETAIL

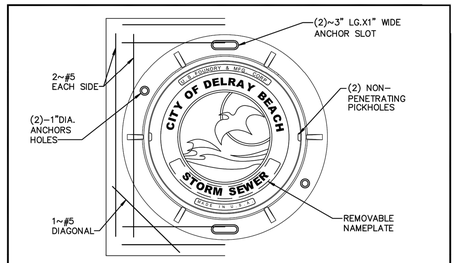
All Gasket In Gasket Recesses



SECTION VIEW

NOTES:

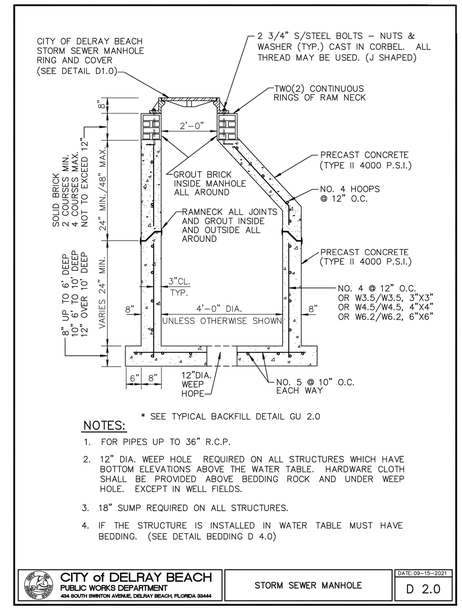
Each Detention vault Is Custom Designed And
Produced To Meet Project And Jobsite Requirements



NOTES:

1. COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
2. FRAME AND COVER SHALL BE U.S. FOUNDRY MR-ORS AND RING SHALL BE USF 576
3. MANHOLE ADJUSTING RINGS SHALL BE CAST IRON, USF TYPE B.
4. CITY LOGO LID TO BE USED ON CITY MAINTAINED STORM SEWER ONLY. STANDARD NO. 5768H IS TO BE USED ON PRIVATELY MAINTAINED STORM SEWER.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	STORM SEWER MANHOLE FRAME & COVER	DATE: 09-15-2021 D 1.0

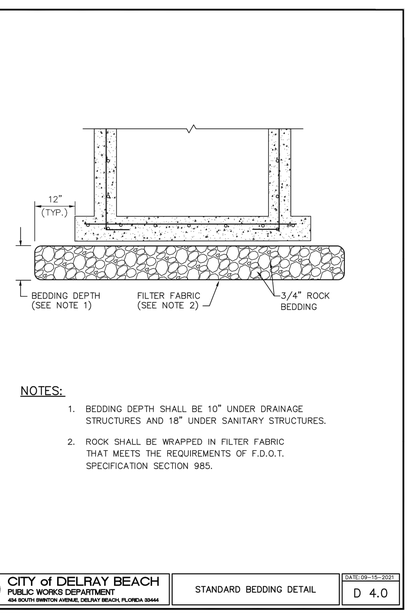


* SEE TYPICAL BACKFILL DETAIL GU 2.0

NOTES:

1. FOR PIPES UP TO 36" R.C.P.
2. 12" DIA. WEEP HOLE REQUIRED ON ALL STRUCTURES WHICH HAVE BOTTOM ELEVATIONS ABOVE THE WATER TABLE. HARDWARE CLOTH SHALL BE PROVIDED ABOVE BEDDING ROCK AND UNDER WEEP HOLE. EXCEPT IN WELL FIELDS.
3. 18" SUMP REQUIRED ON ALL STRUCTURES.
4. IF THE STRUCTURE IS INSTALLED IN WATER TABLE MUST HAVE BEDDING. (SEE DETAIL BEDDING D 4.0)

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	STORM SEWER MANHOLE	DATE: 09-15-2021 D 2.0



NOTES:

1. BEDDING DEPTH SHALL BE 10" UNDER DRAINAGE STRUCTURES AND 18" UNDER SANITARY STRUCTURES.
2. ROCK SHALL BE WRAPPED IN FILTER FABRIC THAT MEETS THE REQUIREMENTS OF F.D.O.T. SPECIFICATION SECTION 985.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	STANDARD BEDDING DETAIL	DATE: 09-15-2021 D 4.0

Items Shown Are Subject To Change Without Notice
Issue Date: April 2016

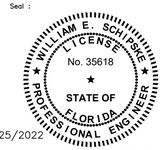
© 2001-2016 Oldcastle Precast, Inc.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :



2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

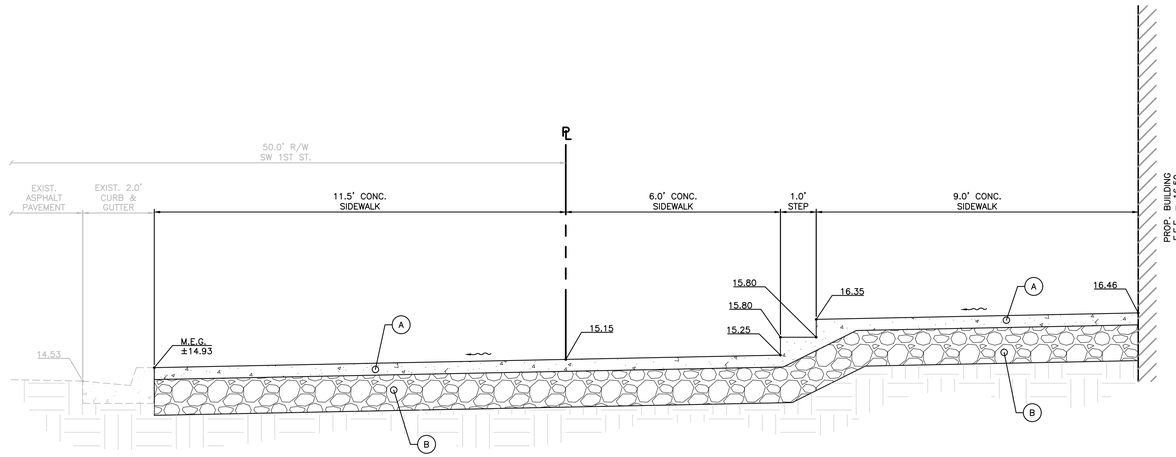
REV #1 02-25-22

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
GENERAL CONSTRUCTION DETAILS

Sheet # :
C4.2

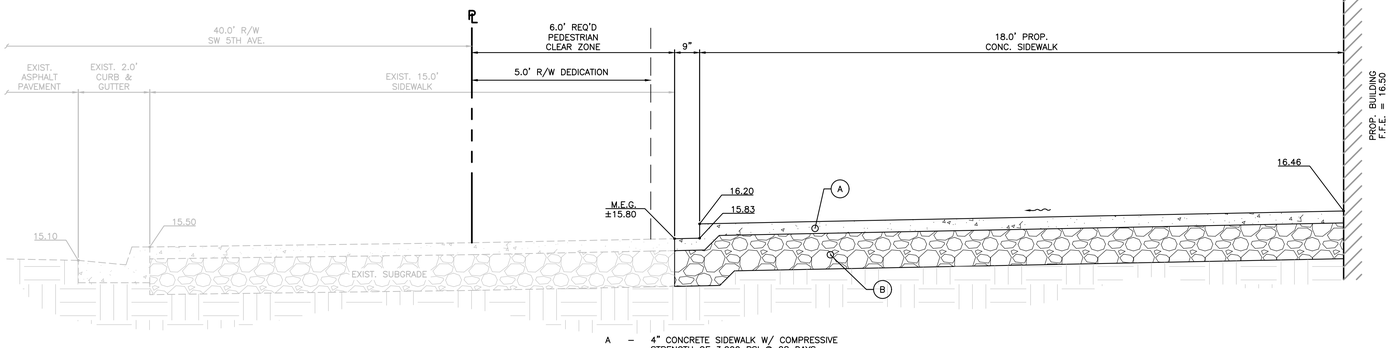


A – 4" CONCRETE SIDEWALK W/ COMPRESSIVE STRENGTH OF 3,000 PSI @ 28 DAYS

B – 12" STABILIZED SUBGRADE COMPACTED TO 98% MAX. DRY DENSITY PER AASHTO T-180 MIN. LBR 100

SECTION A-A

SCALE: 1" = 2'

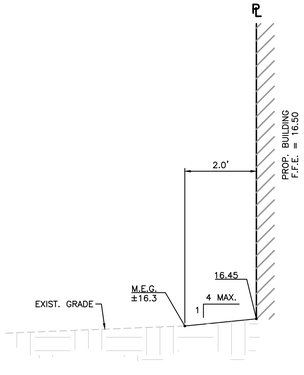


A – 4" CONCRETE SIDEWALK W/ COMPRESSIVE STRENGTH OF 3,000 PSI @ 28 DAYS

B – 12" STABILIZED SUBGRADE COMPACTED TO 98% MAX. DRY DENSITY PER AASHTO T-180 MIN. LBR 100

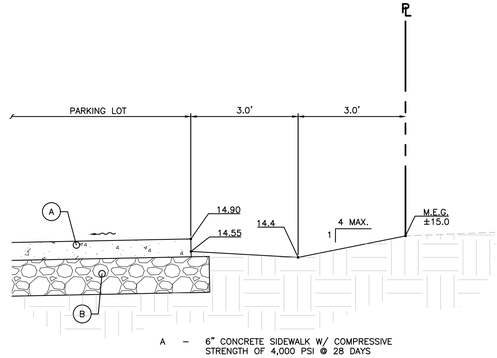
SECTION B-B

SCALE: 1" = 2'



SECTION C-C

SCALE: 1" = 2'



A – 6" CONCRETE SIDEWALK W/ COMPRESSIVE STRENGTH OF 4,000 PSI @ 28 DAYS

B – 12" STABILIZED SUBGRADE COMPACTED TO 98% MAX. DRY DENSITY PER AASHTO T-180 MIN. LBR 100

SECTION D-D

SCALE: 1" = 2'

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

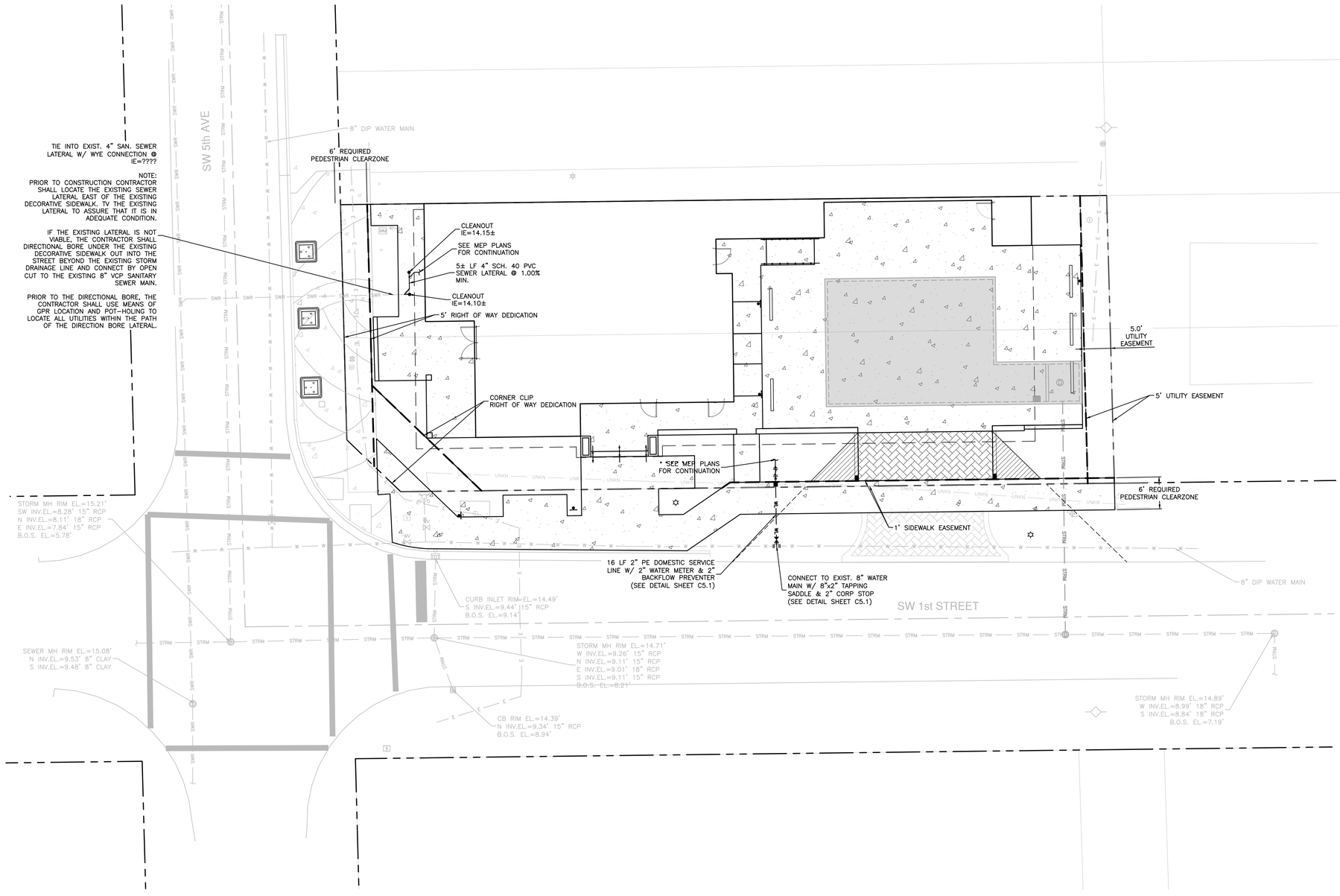
REV #1 02-25-22

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
TYPICAL SECTIONS

Sheet # :
C4.3



HORIZONTAL SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

LEGEND:

- RIGHT OF WAY/PROPERTY LINE
- EXISTING CONCRETE SIDEWALK/SURFACE (TO REMAIN)
- EXISTING CONCRETE PAVERS (TO REMAIN)
- EXISTING STORM DRAINAGE LINE (TO REMAIN)
- EXISTING DRAINAGE CATCH BASIN/CURB INLET/MANHOLE (TO REMAIN)
- EXISTING SANITARY SEWER LINE (TO REMAIN)
- EXISTING SANITARY SEWER MANHOLE (TO REMAIN)
- EXISTING BURIED ELECTRIC LINE (TO REMAIN)
- EXISTING WIRING PULL BOX/ELECTRIC METER/UTILITY POLE (TO REMAIN)
- EXISTING WATER LINE (TO REMAIN)
- EXISTING IRRIGATION LINE (TO REMAIN)
- EXISTING BACKFLOW PREVENTER/WATER VALVE/WATER METER/IRRIGATION CONTROL VALVE/FIRE HYDRANT (TO REMAIN)
- EXISTING UNKNOWN UTILITY LINE (TO REMAIN)
- EXISTING BOLLARD/TRAFFIC SIGN/TRASH RECEPTACLE (TO REMAIN)
- EXISTING TREES (TO REMAIN)
- PROPOSED BUILDING
- PROPOSED HAND RAIL
- PROPOSED CONCRETE SIDEWALK/SURFACE (APPROX. ____ SF)
- PROPOSED ASPHALT RESTORATION (APPROX. 220 SF)
- PROPOSED CONCRETE SIDEWALK/SURFACE RESTORATION (APPROX. 78 SF)
- PROPOSED RELOCATED PAVERS (SEE SHEET C2.0) (APPROX. ___ SF)
- PROPOSED SEWER LATERAL
- PROPOSED SEWER CLEANOUT
- PROPOSED DOMESTIC WATER SERVICE LINE
- PROPOSED WATER METER/BACKFLOW PREVENTER (SEE DETAIL SHEET C5.1)
- PROPOSED STORM DRAINAGE LINE
- PROPOSED DRAINAGE MANHOLE/CATCH BASIN

NOTE:

1. THERE ARE NO AT&T FACILITIES WITHIN THE PROJECT AREA.
2. ANY TREES OR SHRUBS PLACED WITHIN WATER, SEWER, OR DRAINAGE EASEMENTS SHALL CONFORM TO THE CITY OF DELRAY BEACH STANDARD DETAILS; LD 1.1 & LD1,2

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

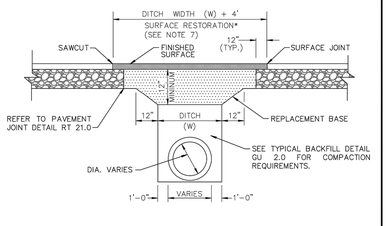
Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
UTILITY PLAN

Sheet # :
C5.0



1. REPLACEMENT BASE TO BE AT MIN. 12" THICK.

2a. BASE MATERIAL SHALL BE PLACED IN TWO LIFTS AND EACH LIFT COMPACTED TO 98% MAXIMUM DENSITY PER AASHTO T-180 (MAX. LIFT THICKNESS = 6").

2b. 24" EXCAVATABLE FLOWABLE FILL MIN. 100 P.S.I. MAY BE USED IN LIEU OF 12" BASE.

3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.

4. ALL DISTURBED PAVEMENT MARKINGS SHALL BE RESTORED IN ACCORDANCE WITH CITY STANDARDS.

5. SURFACE MATERIAL SHALL BE S-III ASPHALTIC CONCRETE (THICKNESS SHOULD BE TWICE THE THICKNESS OF THE ADJACENT EXISTING ASPHALT).

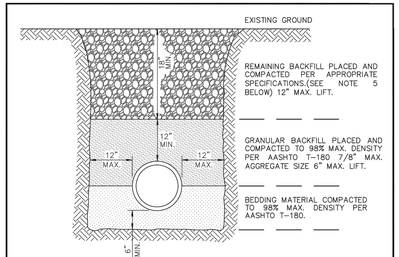
6. ANY PAVEMENT CUTS SHALL BE COLD PATCHED AT END OF EACH WORKING DAY TO FACILITATE UNHINDERED TRAFFIC FLOW.

7. ROADWAYS SHALL BE MILLED AND RESURFACED 50' IN EACH DIRECTION AT TIME OF PAVEMENT REPAIR THE SURFACE RESTORATION SHALL EXTEND 50' IN EACH DIRECTION.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

CARRIER PIPE SUPPORTS

DATE: 09-15-2021
GU 1.0



NOTES:

1. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGE ROCKS SHALL BE REMOVED OFF SITE AND DISPOSED IN A PROPER LANDFILL; BEDDING MATERIAL AND BACKFILL CONSISTING OF WASHED AND GRADED LIMEROCK 3/8" -7/8" SIZING.

2. THE PIPE AND/OR STRUCTURE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.

3. THE PIPE AND/OR STRUCTURE SHALL BE PLACED IN A DRY TRENCH.

4. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, AND DEBRIS.

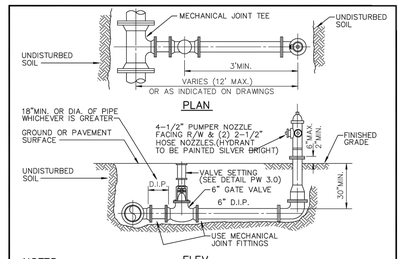
5. COMPACT BACKFILL TO 98% DENSITY UNDER PAVEMENT AND TO 95% DENSITY ELSEWHERE.(AASHTO T-180)

6. COMPACTION AND DENSITY TESTS SHALL BE COMPLETED DURING BACKFILL OPERATIONS, CONTRACTORS NOT FOLLOWING THIS PROCEDURE, FOR WHATEVER REASONS, SHALL BE REQUIRED TO RE-EXCAVATE THE AREA IN QUESTION, DOWN TO THE BEDDING MATERIAL, THEN BACKFILL FOLLOWING THE ABOVE PROCEDURES.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL BACKFILL DETAIL

DATE: 09-15-2021
GU 2.0



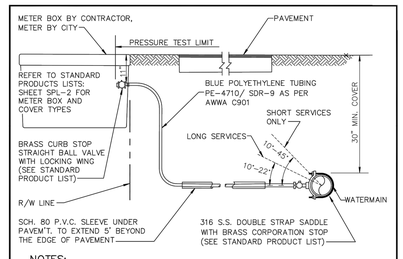
NOTES:

1. HYDRANT SHALL BE INSTALLED PLUMB AND TRUE IN UNOBSTRUCTED LOCATION. (7.5' CLEARANCE ON THREE SIDES, 4' CLEARANCE AT REAR, WITH 3' ACCESS LANE)
2. NO BARREL EXTENSION SHALL BE PERMITTED.
3. VALVE SHALL BE PLACED ADJACENT TO MAIN.
4. ANCHOR TEES AND FITTINGS ARE PERMITTED.
5. HYDRANT SHALL BE MUELLER SUPER CENTURION, AA423 5¼" WITH TRAFFIC BREAKAWAY FLANGE AND 5¼" VALVE.
6. HYDRANTS SHALL NOT ENCROACH IN SIDEWALKS, ROADWAYS, OR BIKE PATHS.
7. ON RUNS LONGER THAN 20 FEET A SECOND VALVE IS REQUIRED AT THE HYDRANT.
8. ALL HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH CITY OF DELRAY BEACH FIRE PREVENTION CODE SEC. 96.05.
9. IN CERTAIN SITUATIONS, PROTECTIVE BOLLARDS MAY BE REQUIRED AS DIRECTED BY THE ENGINEERING DEPT. (SEE BOLLARD DETAIL PW 7.0)
10. FIRE HYDRANTS INSTALLED BUT NOT YET IN SERVICE SHALL BE COVERED WITH A BURLAP, OR PLASTIC SACK, OR HAVE OUT OF SERVICE RING IN PLACE.
11. ALL HYDRANT LEADS GREATER THAN 20-FEET MUST HAVE AUTOMATIC FLUSHER INSTALLED AT HYDRANT END (KUPFERLE #9400-WC STANDARD).
12. REMOVE CHAINS FROM HYDRANT AND PAINT SHERWIN WILLIAMS SILVER BRITE.
13. NO THRUST BLOCKS SHALL BE PERMITTED.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL FIRE HYDRANT INSTALLATION

DATE: 09-15-2021
PW 6.0



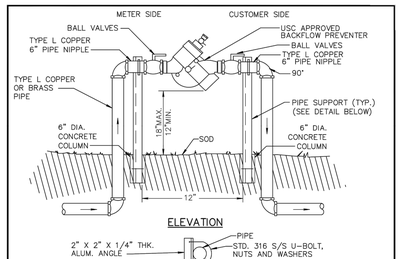
NOTES:

1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
2. SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
3. ALL METERS REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1"MIN.).
4. NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
5. MAXIMUM SERVICE LENGTH IS 100' TO METER.
6. CASING PIPE I.D. SHALL BE SERVICE O.D. PLUS 1" MINIMUM.
7. MINIMUM BEND RADIUS ON SERVICES SHALL BE 14" ON ALL SERVICES BEHIND METER.
8. METER SIZE WILL BE DETERMINED BY PUBLIC UTILITIES DEPT. UPON APPLICATION FOR SERVICE.
9. ALL VALVES TO BE BALL VALVES.
10. METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
11. ALL SERVICES UNDER ROADWAYS ARE TO BE INSTALLED BY TRENCHLESS METHOD, UNLESS OTHERWISE APPROVED.
12. ALL EXISTING SERVICES TO BE FIELD VERIFIED BY BUILDER/CONTRACTOR/ DEVELOPER; IF EXISTING SERVICE IS GALVANIZED, BUILDER/CONTRACTOR/ DEVELOPER SHALL REPLACE WITH POLYETHYLENE PIPING FROM MAIN TO THE METER.
13. ALL COMMERCIAL WATER SERVICE SHALL BE A MINIMUM OF 2".
14. WATER METERS SHALL BE LOCATED OUTSIDE ANY DRIVEWAYS BY 2'

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL URBAN/REDEVELOPMENT AREA SERVICE CONNECTION IN DRIVEWAYS

DATE: 09-15-2021
PW 13.0



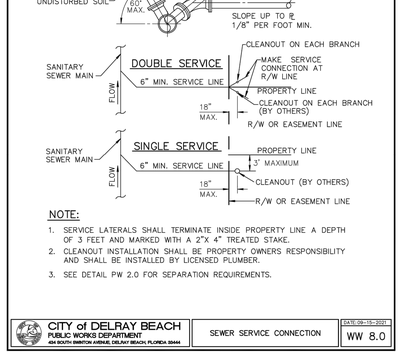
NOTES:

1. FOR ALL SERVICES LESS THAN OR EQUAL TO 2" DIA.
2. ABOVE GRADE PIPING SHALL BE BRASS OR TYPE "L" COPPER OR BRASS TUBING.
3. ALL COPPER JOINTS SHALL BE MADE WITH 95/5 SOLDER.
4. USC APPROVED RPZ BACKFLOW PREVENTER IS REQUIRED IN ACCORDANCE WITH CITY OF DELRAY BEACH CODE OF ORDINANCES TITLE V, CHAPTER 52.83.
5. USC APPROVED RPZ BACKFLOW PREVENTER IS REQUIRED FOR ALL COMMERCIAL PROPERTIES AND ALL RESIDENTIAL PROPERTIES WITH FIRE SPRINKLER SYSTEMS.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

REDUCED PRESSURE ZONE BACKFLOW PREVENTER

DATE: 09-15-2021
PW 17.0



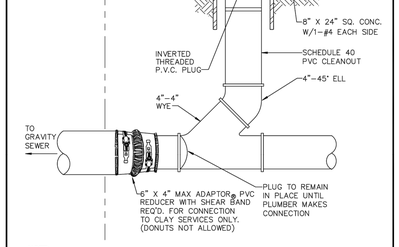
NOTE:

1. SERVICE LATERALS SHALL TERMINATE INSIDE PROPERTY LINE A DEPTH OF 3 FEET AND MARKED WITH A 2"X 4" TREATED STAKE.
2. CLEANOUT INSTALLATION SHALL BE PROPERTY OWNERS RESPONSIBILITY AND SHALL BE INSTALLED BY LICENSED PLUMBER.
3. SEE DETAIL PW 2.0 FOR SEPARATION REQUIREMENTS.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

SEWER SERVICE CONNECTION

DATE: 09-15-2021
WW 8.0



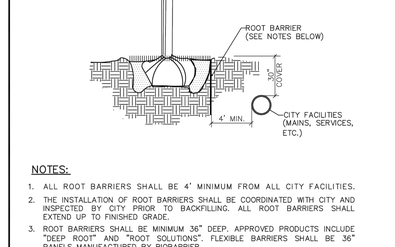
NOTE:

1. INVERTED BRASS CAP SHALL BE USED IN GRASS AREAS IN LIEU OF CASTING AND CONE COLLAR.
2. MINIMUM DEPTH OF SERVICE LATERAL SHALL BE 3 FEET.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL RESIDENTIAL CLEANOUT

DATE: 09-15-2021
WW 9.0



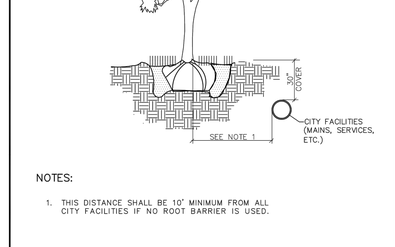
NOTES:

1. ALL ROOT BARRIERS SHALL BE 4' MINIMUM FROM ALL CITY FACILITIES.
2. THE INSTALLATION OF ROOT BARRIERS SHALL BE COORDINATED WITH CITY AND INSPECTED BY CITY PRIOR TO BACKFILLING. ALL ROOT BARRIERS SHALL EXTEND UP TO FINISHED GRADE.
3. ROOT BARRIERS SHALL BE MINIMUM 36" DEEP. APPROVED PRODUCTS INCLUDE "DEEP ROOT" AND "ROOT SOLUTIONS". FLEXIBLE BARRIERS SHALL BE 36" PANELS MANUFACTURED BY BIOBARRIER.
4. ALL ROOT BARRIERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL TREE WITH ROOT BARRIER

DATE: 09-15-2021
LD 1.0



NOTES:

1. THIS DISTANCE SHALL BE 10' MINIMUM FROM ALL CITY FACILITIES IF NO ROOT BARRIER IS USED.

CITY of DELRAY BEACH
PUBLIC WORKS DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL TREE WITHOUT ROOT BARRIER

DATE: 9-15-2021
LD 2.0

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE LICENSE No. 35618 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

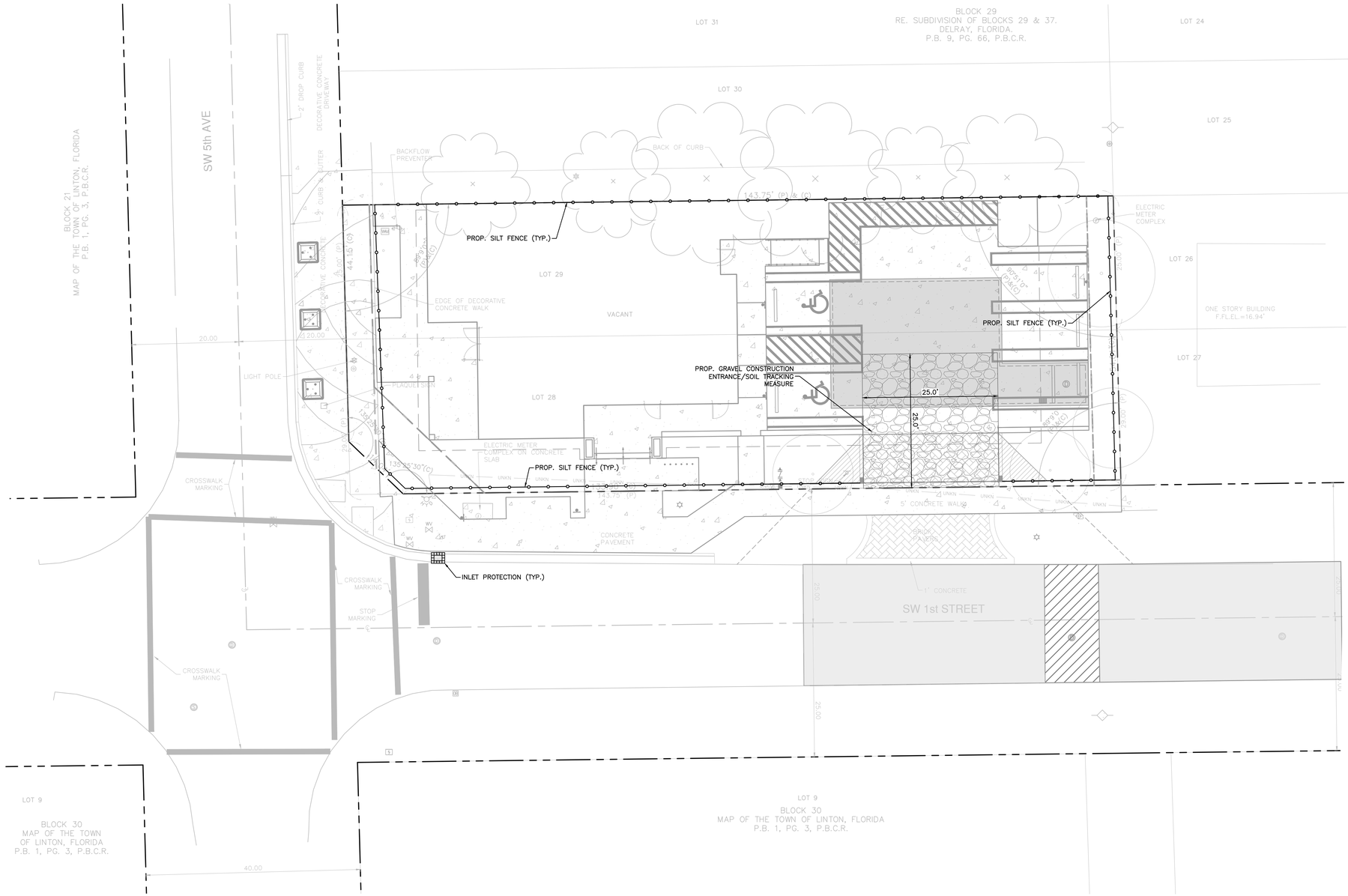
REV #1 02-25-22

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
WATER AND SEWER DETAILS

Sheet # :
C5.1



HORIZONTAL SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

LEGEND:

- RIGHT OF WAY/PROPERTY LINE
- EXISTING CONCRETE SIDEWALK/SURFACE (TO REMAIN)
- EXISTING CONCRETE PAVERS (TO REMAIN)
- EXISTING DRAINAGE CATCH BASIN/CURB INLET/MANHOLE (TO REMAIN)
- EXISTING SANITARY SEWER MANHOLE (TO REMAIN)
- EXISTING WIRING PULL BOX/ELECTRIC METER/UTILITY POLE (TO REMAIN)
- EXISTING BACKFLOW PREVENTER/WATER VALVE/WATER METER/IRRIGATION CONTROL VALVE/FIRE HYDRANT (TO REMAIN)
- EXISTING BOLLARD/TRAFFIC SIGN/TRASH RECEPTACLE (TO REMAIN)
- EXISTING TREES (TO REMAIN)
- PROPOSED BUILDING
- PROPOSED HAND RAIL
- PROPOSED CONCRETE SIDEWALK/SURFACE (APPROX. 655 SF)
- PROPOSED ASPHALT RESTORATION (APPROX. 122 SF)
- PROPOSED CONCRETE SIDEWALK/SURFACE RESTORATION (APPROX. 120 SF)
- PROPOSED RELOCATED PAVERS (SEE SHEET C2.0) (APPROX. 70 SF)
- PROPOSED WATER METER/BACKFLOW PREVENTER
- PROPOSED SILT FENCE
- PROPOSED GRAVEL CONSTRUCTION ENTRANCE/SOIL TRACKING MEASURE

EROSION CONTROL & CONSTRUCTION ENTRANCE NOTES:

1. SILT FENCES ARE TO BE REMOVED ONLY AFTER EARTHWORK ACTIVITIES ARE COMPLETED AND SEEDING AND MULCHING HAS TAKEN PLACE.
2. SILT FENCES ALONG WETLAND BUFFERS ARE TO REMAIN IN PLACE FOR AT LEAST 120 DAYS AFTER CONSTRUCTION ACTIVITIES HAVE SEIZED.
3. SOD ALL DISTURBED OR NEWLY CREATED LAKE BANKS AS PER LANDSCAPE AND IRRIGATION SPECIFICATIONS.
4. TURBIDITY CONTROL BARRIERS SHALL BE INSTALLED WITHIN EXISTING LAKES, EXISTING CANALS, ALONG ALL DISTURBED SHORELINES AND WHERE EARTHWORK,(FILL/CUT AND/OR DREDGING) ACTIVITIES ARE TO TAKE PLACE.
5. SILT FENCE ARE TO BE SETBACK AS FOLLOWS:
   –5' FROM FACES OF WALLS/FOOTINGS
   –5' FROM PROPERTY LINES
   –5' FROM WETLAND BUFFERS (EXCEPT WHERE A PROPOSED BUFFER OR WETLAND ENCROACHMENT IS SPECIFIED)
   –5' BEYOND LIMITS OF EARTHWORK (FILL/CUT) OR GRADING ACTIVITIES.
6. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM WITH LOCAL CITY/COUNTY AND WATER MANAGEMENT DISTRICT SPECIFICATIONS, SUBJECT TO AUTHORIZED AND APPROVED VARIANCES, WAIVERS AND/OR CONDITIONAL CHANGES.
7. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN, CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTATION OF SILT OFF THE SITE.
8. CONTRACTOR SHALL KEEP ANY AND ALL SAND, SILT OR OTHER DEBRIS FROM MOVING OFF–SITE. USE AND MAINTAIN SILT FENCE JUST INSIDE OF PROPERTY LINE.
9. CONTRACTOR SHALL BLOCK INTRUSION OF SAND, SILT OR OTHER DEBRIS INTO ANY DRAINAGE OR SANITARY SEWER STRUCTURE OR PIPING ON OR ADJACENT TO SITE.
10. ALL CLEARED AREAS FOR IMPROVEMENT AND/OR CONSTRUCTION SHALL BE WATERED TO PREVENT WIND EROSION.
11. ALL AREAS AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN EXISTING CONDITION, UNLESS SPECIFICALLY EXEMPTED BY THE PLANS. THE COST FOR SUCH RESTORATION SHALL BE INCIDENTAL TO OTHER CONSTRUCTION AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
12. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THESE PLANS AND FIELD CONDITIONS PRIOR TO CONSTRUCTION.
13. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL PROVIDE TREE PROTECTION BARRIERS TO MEET THE REQUIREMENTS OF LOCAL SPECIFICATIONS.
14. THE CONTRACTOR SHALL SELECTIVELY CLEAR ONLY THE ARES REQUIRED FOR CONSTRUCTION AND STABILIZE ANY POTENTIAL EROSION AREAS IMMEDIATELY FOLLOWING COMPLETION OF CONSTRUCTION.
15. CONTRACTOR IS REQUIRED BY NPDES TO KEEP A LOG ON SITE FOR THE SOIL EROSION AND SEDIMENT CONTROL MEASURES INDICATED ON THE PLAN. THE LOG SHALL CONTAIN DATES FOR: INSTALLATION OF CONTROL MEASURES, MAJOR SITE CONSTRUCTION ACTIVITIES, INSPECTION ON AT LEAST A WEEKLY BASIS AND INSPECTION AFTER ANY RAINFALL EVENT THAT IS 1/2" OR GREATER.
16. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
17. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
18. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
19. ALL EROSION CONTROL MATERIALS, CONSTRUCTION & MAINTENANCE TO BE PER APPLICABLE SECTIONS OF FDOT STANDARD SPECIFICATION #104.
20. USE SANDBAGS, SYNTHETIC BALES OR OTHER APPROVED METHODS TO CHANNELIZE RUNOFF TO BASIN REQUIRED.
21. COURSE AGGREGATE & FILTER FABRIC TO PER SECTIONS OF FDOT STANDARD SPECIFICATION #901 & #985 RESPECTIVELY.
22. CONTRACTOR TO FOLLOW SILT FENCE INSTALLATION PHASING PER SWPPP.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE
LICENSE
No. 35618
STATE OF FLORIDA
PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

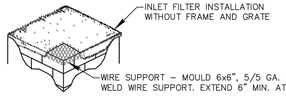
REV #1 02–25–22

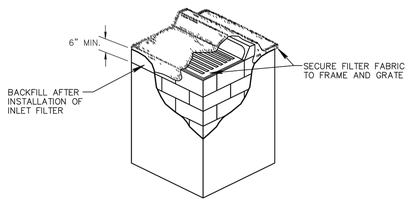
Date : 01–05–2022
S+A Project No : 18063
ML Project No: 19–00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
STORMWATER POLLUTION PREVENTION PLAN

Sheet # :
C6.0





NOT TO SCALE

NOTES:

1. CONTRACTOR IS TO CLEAN INLET FILTER AFTER EVERY STORM.
2. CONTRACTOR TO REMOVE FABRIC JUST PRIOR TO PAVING.

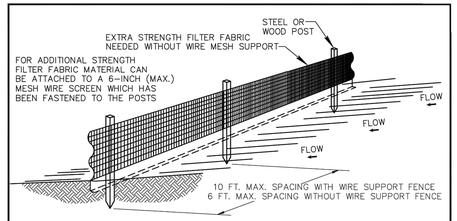
A SEDIMENT TRAP WILL BE EXCAVATED BEHIND THE CURB AT THE INLET. THE BASIN SHALL BE AT LEAST 12 TO 14 INCHES IN DEPTH, APPROXIMATELY 36 INCHES IN WIDTH, AND APPROXIMATELY 7 TO 10 FEET IN LENGTH PARALLEL TO THE CURB.

STORM WATER WILL REACH THE SEDIMENT TRAP VIA CURB CUTS ADJACENT TO EACH SIDE OF THE INLET STRUCTURE. THESE OPENINGS SHALL BE AT LEAST 12 INCHES IN LENGTH. STORM WATER MAY ALSO REACH THE BASIN VIA OVERLAND FLOW LAND AREA BEHIND THE CURB. THE CURB CUTS SHALL BE REPAIRED WHEN THE SEDIMENT TRAP IS REMOVED.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	INLET FILTER DETAIL	DATE:09-15-2021 D10.0

1. THE INTENT OF EROSION CONTROL MEASURES INDICATED GRAPHICALLY ON PLANS IS TO PROVIDE A BARRIER TO CONTAIN SILT AND SEDIMENT ON THE PROJECT SITE. THIS REPRESENTATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE TEST OF EROSION CONTROL EFFECTIVENESS IS NOT TO BE DETERMINED BY ADHERENCE TO THE REPRESENT SET FORTH ON THE DRAWINGS AND SPECIFICATIONS, BUT BY MEETING THE REGULATIONS SET FORTH BY THE AUTHORITY HAVING JURISDICTION OVER WATER QUALITY CONTROL AND OTHER SEDIMENTATION RESTRICTION REQUIREMENTS IN THE REGION.
2. APPROVED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY CLEARING GRADING, EXCAVATION, FILLING, OR OTHER LAND DISTURBANCE ACTIVITIES, EXCEPT THOSE OPERATIONS NEEDED TO INSTALL SUCH MEASURES.
3. INSPECTION OF ALL EROSION CONTROL MEASURES SHALL BE CONDUCTED WEEKLY, OR AFTER EACH RAINFALL EVENT. REPAIR, AND/OR REPLACEMENT OF SUCH MEASURES SHALL BE MADE PROMPTLY, AS NEEDED.
4. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
5. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED IF DEEMED NECESSARY BY ONSITE INSPECTION.
6. FAILURE TO PROPERLY INSTALL AND MAINTAIN EROSION CONTROL PRACTICES SHALL RESULT IN CONSTRUCTION BEING HALTED.
7. DRAINAGE INLETS SHALL BE PROTECTED BY FILTER AND GRADED ROCK AS PER INLET PROTECTION DETAIL.
8. ANY ACCESS ROUTES TO SITE SHALL BE BASED WITH CRUSHED STONE, WHERE PRACTICAL.
9. EROSION CONTROL MEASURES ARE TO BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
10. WHENEVER FEASIBLE, NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED.
11. ALL WORK IS TO BE IN COMPLIANCE WITH THE RULES AND REGULATIONS SET FORTH BY THE STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE CITY OF DELRAY BEACH.
12. DISCHARGE FROM DEWATERING OPERATIONS SHALL BE RETAINED ONSITE IN A CONTAINMENT AREA.

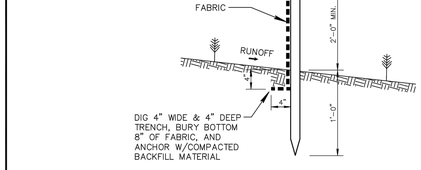
CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	EROSION CONTROL NOTES DETAIL	DATE:09-15-2021 D 11.0



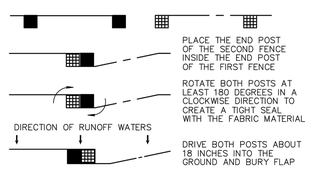
NOTES:

1. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES.
2. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS.
3. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES. WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
5. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES, OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
6. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
8. ALL PROJECTS REQUIRE SUBMITTAL OF POLLUTION PREVENTION PLAN (PPP).
9. ALL PROJECTS 1 AC. OR MORE MUST SUBMIT NOTICE OF INTENT (NOI) TO FDEP.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SILT FENCE INSTALLATION DETAIL (SHEET 1 of 2)	DATE:09-15-2021 D12.0

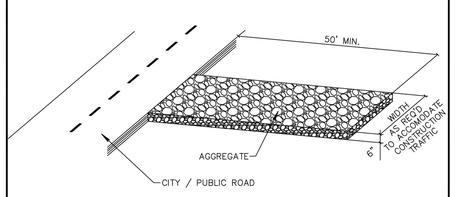


SILT FENCE SECTION
NOT TO SCALE



ATTACHING TWO SILT FENCES
NOT TO SCALE

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SILT FENCE INSTALLATION DETAIL (SHEET 2 OF 2)	DATE:09-15-2021 D 12.1



NOTE:
A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AND CONTAIN AN AGGREGATE LAYER (FDOT AGGREGATE NO.1), AT LEAST 6–INCHES THINK. IT MUST EXTEND TO THE WIDTH OF THE VEHICULAR INGRESS AND EGRESS AREA.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	STABILIZED CONSTRUCTION ENTRANCE DETAIL	DATE:09-15-2021 D 13.0

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

WILLIAM E. SCHIPSKE
LICENSE
No. 35618
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

2/25/2022

Name : WILLIAM E. SCHIPSKE
License # : 35618

Consultants :

MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida - 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

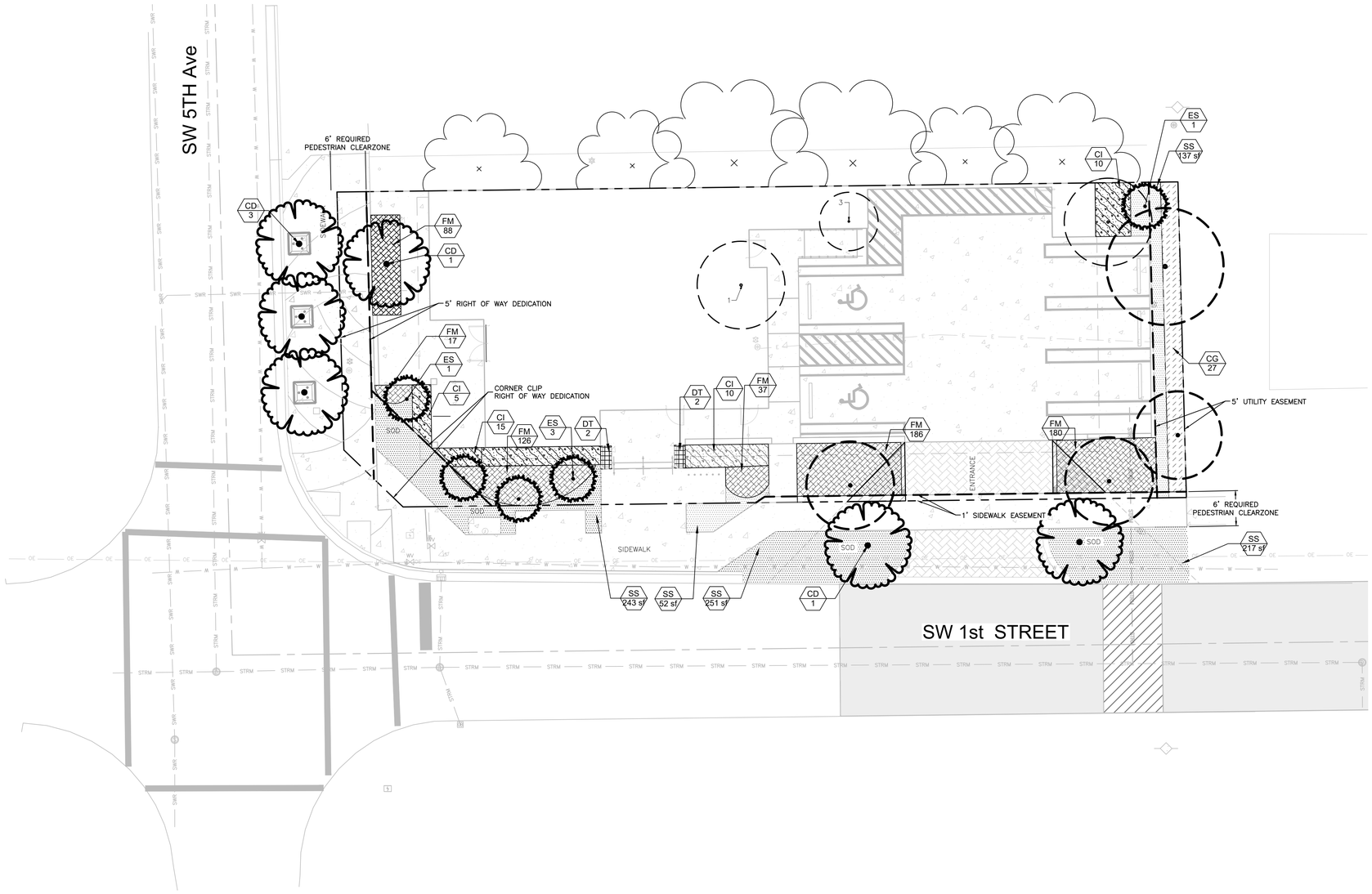
REV #1 02-25-22

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : MD
Checked By : WS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
STORMWATER POLLUTION PREVENTION DETAILS

Sheet # :
C6.1



HORIZONTAL SCALE

0 5 10 20

(IN FEET)

1 INCH = 10 FEET

This item has been digitally signed and sealed by Brian R. Shore, PLA on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

LANDSCAPE NOTES:

ALL PLANT MATERIAL SHALL BE FLORIDA #1 OR BETTER.

MULCH SHALL BE APPLIED TO A MINIMUM DEPTH OF THREE (3) INCHES IN ALL PLANTING BEDS.

ALL PROHIBITED PLANT SPECIES SHALL BE ERADICATED FROM THE SITE.

ALL LANDSCAPE AREAS SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM, AUTOMATICALLY OPERATED, TO PROVIDE COMPLETE COVERAGE TO ALL PLANT MATERIAL AND GRASS TO BE MAINTAINED.

SOD AND IRRIGATION SHALL BE PROVIDED WITHIN THE UNPAVED PORTION OF THE RIGHT-OF-WAY ADJACENT TO THE PROPERTY LINE.

REINFORCED CONCRETE CURBING AT LEAST SIX (6) INCHES IN HEIGHT SHALL BE PROVIDED AROUND ALL LANDSCAPE ISLANDS AND AS A SEPARATOR BETWEEN ALL LANDSCAPED AREAS THAT ARE ADJACENT TO VEHICULAR USE AREAS UNLESS CURBING WILL INTERFERE WITH THE DRAINAGE.

EXISTING NATIVE SOIL WITHIN ALL LANDSCAPE ISLANDS, INTERIOR LANDSCAPE STRIPS AND PERIMETER LANDSCAPE STRIPS, ADJACENT TO VEHICULAR USE AREAS, SHALL BE EXCAVATED DOWN TO A DEPTH OF 30" BELOW GRADE, EXCEPT FOR A 12" BUFFER FROM THE INSIDE OF CURB OR PAVEMENT. a SUITABLE PLANTING MIXTURE OF FIFTY/FIFTY(50-50) SAND/TOPSOIL SHALL EITHER BE BACKFILLED IN PLACE OF NATIVE SOIL OR EFFICIENTLY MIXED WITH THE NATIVE SOIL TO CREATE AN OPTIMUM ENVIRONMENT FOR SUCCESSFUL ROOT DEVELOPMENT. IF NATIVE SOIL IS TO BE MIXED, IT SHALL FIRST BE SCREENED TO REMOVE ROCKS AND DEBRIS LARGER THAN ¾" IN DIAMETER PRIOR TO MIXING. THE PROPERTY SHALL BE REQUIRED TO HAVE AN OPEN BED INSPECTION PRIOR TO BACKFILLING TO INSURE THE 30" DEPTH HAS BEEN MET.

LANDSCAPE CALCULATIONS		
A	TOTAL LOT AREA	7292 S.F.
B	STRUCTURES, PARKING, WALKWAYS, DRIVES, ETC.	6083 S.F.
C	TOTAL PERVIOUS LOT AREA	1209 S.F.
D	AREA OF SHRUBS AND GROUNDCOVER REQUIRED	437 S.F.
E	AREA OF SHRUBS AND GROUNDCOVER PROVIDED	1862 S.F.
F	NATIVE VEGETATION REQUIRED	110 S.F.
G	NATIVE VEGETATION PROVIDED	354 S.F.
H	TOTAL PAVED VEHICULAR USE AREA	2512 S.F.
I	TOTAL INTERIOR LANDSCAPE AREA REQUIRED	252 S.F.
J	TOTAL INTERIOR LANDSCAPE AREA PROVIDED	662 S.F.
K	TOTAL INTERIOR SHADE TREES REQUIRED	2.01
L	TOTAL INTERIOR SHADE TREES PROVIDED	3
M	TOTAL L.F. SURROUNDING PARKING OR VEHICULAR USE AREAS	202 L.F..
N	TOTAL NUMBER OF PERIMETER TREES REQUIRED	6.7
O	TOTAL NUMBER OF PERIMETER TREES PROVIDED	9
P	TOTAL NUMBER OF EXISTING TREES TO BE SAVED	4
Q	TOTAL NUMBER OF NATIVE TREES REQUIRED	4
R	TOTAL NUMBER OF NATIVE TREES PROVIDED	15
S	TOTAL NUMBER OF TREES ON PLAN PROVIDED	15

PLAN SCHEDULE.

TREES	CODE	BOTANICAL / COMMON NAME	CONT.	CAL.	SIZE		QTY
	CD	Coccoloba diversifolia / Pigeon Plum Full	Field Grown	3" CAL	14` HT		6
	ES	Eugenia SPP / Stoppers (TREE FORM) NATIVE TREE. 150 SF CREDIT FOR MITTIGATION.	65 gal	3.5" CAL	8` OAH		5
SHRUB AREAS	**CODE**	**BOTANICAL / COMMON NAME**	**CONT.**	**HT.**		**SPACING**	**QTY**
	CI	Chrysobalanus icaco / Coco Plum 24" HT	7 GAL	24" HT.		30" o.c.	40
	CG	Clusia guttifera nana / Dwaft Clusia Full	7 GAL	24" HT.		30" o.c.	27
	DT	Dianella tasmanica / Flax Lily Full	1 GAL	18" HT.		24" o.c.	4
	FM	Ficus microcarpa `Green Island` / Green Island Ficus Full	1 GAL / 12" HT	12" HT.		12" o.c.	578
SOD/SEED	**CODE**	**BOTANICAL / COMMON NAME**	**CONT**			**SPACING**	**QTY**
	SS	Stenotaphrum secundatum / St. Augustine Grass full	FLAT				900 sf

TREE DISPOSITION CHART

TREE #	COMMON NAME	BOTANICAL NAME	DBH	Height	Spread	Condition	DISPOSITION
1	Silver buttonwood	*Conocarpus erectus*	5"	10'	15'	Fair	Remove
2	Silver buttonwood	*Conocarpus erectus*	7"	10'	15'	Fair	Remove
3	Silver buttonwood	*Conocarpus erectus*	4"	8'	10'	Good	Remove
4	Silver buttonwood	*Conocarpus erectus*	8"	15'	20'	Good	Remain
5	Silver buttonwood	*Conocarpus erectus*	6"	10'	15'	Good	Remain
6	Silver buttonwood	*Conocarpus erectus*	8"	10'	15'	Good	Remain
7	Silver buttonwood	*Conocarpus erectus*	5"	8'	15'	Good	Remain

MITIGATION REQUIREMENTS	
TOTAL DBH TO BE REMOVED (INCHES)	16
TREES # 1 = 5" + TREE #2 = 7" + TREE # 3 = 4"	16
TOTAL TREES TO BE REPLACED	5
TOTAL DBH REPLACED (INCHES) EUGENIA STOPPERS (5X3.5"CAL)	17.50

City of Delray Beach mitigation requirements for Multi- Family/ industrial / Commercial use Mitigation. The total DBH of all trees with a condition rating of 50 percent or greater removed shall be replaced with the equivalent number of caliper inches of replacement trees, installed at a minimum size as required by Section 4.6.16. (Ord. No. 19-17, 1, 8-2-17)

EXISTING TREE.

XX TREE NUMBER.

TREE.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG

It's fast. It's free. It's the law.

www.callsunshine.com

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

REGISTERED LANDSCAPE ARCHITECT BRIAN R. SHORE LA 6666770 STATE OF FLORIDA

1/5/2022

Name : Brian R. Shore

License # : 6666770

Consultants :

MILLER LEGG

South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

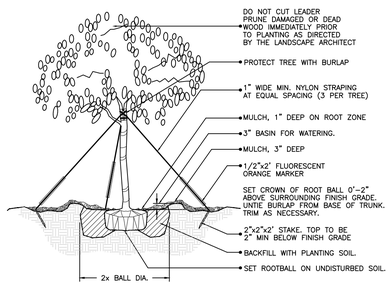
Sheet Title :
LANDSCAPE PLAN

Sheet # :
LNP.1

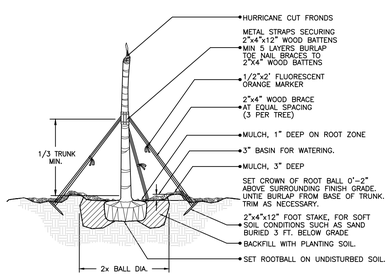
GENERAL NOTES:

1. Any trees or shrubs placed within water, sewer or drainage easements shall conform to the City of Delray Beach Standard Details; LD 1.1 & LD 1.2
2. PLANT MATERIAL: All plant material shall be Florida #1 or better as established by "Grades and Standards for Nursery Plants" of the state of Florida, Department of Agriculture.
3. All trees, shrubs and groundcovers shall be of the sizes as specified in the Plant List.
4. Quantities listed on the the Plant List are for estimating purposes. Contractor shall verify all quantities. Mulch, topsoil, fertilizer, etc. shall be included in the unit cost of the plants.
5. Where there is a discrepancy either in quantities, plant names, sizes or specifications between the plan or plant list, the plan takes precedence.
6. All planting beds and water basins for trees shall be covered with a 3" minimum depth of shredded eucalyptus or florimulch grade 'B' or better.
7. The Planting Plan shall be installed in compliance with all existing codes and applicable deed restrictions.
8. SOD: All areas not used for buildings, vehicular use areas, walks or planting beds shall be grassed. Grassing shall extend to any abutting street pavement edge and to the mean waterline of any abutting canal, lake or waterway.
9. PLANTING SOIL: All trees and shrubs shall be planted with a minimum of 12" topsoil around and beneath the rootball. Minimum topsoil shall be 6" for groundcover areas and 2" for sodded grass areas.
10. Planting soil to be a weed-free mixture of 50% sand, 40% muck, and 10% Canadian peat. All plant material to receive planting soil as per details.
11. Contractor is responsible for determining all utility locations and installing facilities so as to not conflict. All damage to existing utilities or improvements caused by Contractor shall be repaired at no additional cost to the Owner.
12. Contractor to notify "Sunshine State One Call of Florida, Inc." at 1-800-432-4770 Two Full Business Days prior to digging for underground utility locations.
13. Contractor shall be responsible for providing final grading of all associated planting areas.
14. After final grade, area to be raked to 6" depth and all rock and foreign inorganic materials removed and disposed of properly off-site.
15. All planting holes to be hand dug except where machine dug holes will not adversely affect or damage utilities or improvements (see note 8).
16. No plunging of any tree or palm will be accepted. All plants to be planted at the nursery grade or slightly higher.
17. Contractor shall stake & guy all trees and palms at time of planting as per the appropriate detail. Contractor is responsible for the maintenance and/or repair of all staking and guying during warranty period and removal & disposal of staking after establishment period.
18. Fertilizer for grass areas shall be NPK 16-4-8 @ 12.5 lbs/1000 s.f. or 545 lbs/acre. Nitrogen 50% slow release form & fertilizer to include secondary micronutrients.
19. SUBSTITUTIONS AND CHANGES: All substitutions and changes shall be approved in writing prior to installation. Any discrepancies between plans, site and specifications shall be brought to the immediate attention of the Landscape Architect, the owner and governing municipality.
20. WATERING: All plant material shall be watered in at time of planting in accordance with standard nursery practices. In addition, Contractor will continue watering of plant material until substantial completion and as needed thereafter for a period of 2 months.
21. All new plant material shall be guaranteed for 1 year from time of final acceptance of project. Any plant material not in a healthy growing condition will be replaced by the Contractor at no additional cost to the Owner within 10 days of notification. For all replacement plant material, the warranty period shall be extended an additional 45 days beyond the original warranty period. All trees that lean or are blown over, caused by winds less than 75 mph, will be re-set and braced by the Contractor at no additional cost to the Owner.
22. The successful bidder shall furnish to the Owner a unit price breakdown for all materials. The Owner may, at its discretion, add or delete from the materials utilizing the unit price breakdown submitted.
23. No plant material will be accepted showing evidence of cable, chain marks, equipment scars, or otherwise damaged.
24. Plant material will not be accepted when the ball of earth surrounding its roots has been cracked, broken or otherwise damaged.
25. Root-prune all trees a minimum of (8) weeks prior to planting.
26. All plant material planted within the sight distance triangle areas (see plan) shall provide unobstructed cross-visibility at a horizontal level between 30 inches and 8 feet above adjacent street grade.
27. No canopy trees shall be planted within 12 feet of a light pole. No palm species shall be planted within 6 feet of a light pole.
28. Tree protection barricades shall be provided by Landscape Contractor around existing trees that may be impacted by the proposed construction. Prior to any construction a tree protection barricade inspection shall be conducted by the landscape architect, owner or governing municipality. Refer to landscape detail for tree preservation barricade fencing.
29. In all pedestrian areas, all trees and palms shall be maintained to allow for clear passage at an 8 foot clear trunk.
30. All landscape material shall be setback a minimum of 10' from any Fire Hydrant.
31. Contractor shall preserve all the existing trees near to the site of construction
32. Existing native soil within all landscape islands, interior landscape strips and perimeter landscape strips, adjacent to vehicular use areas, shall be excavated down to a depth of thirty (30) inches below existing grade, except for a 12" buffer from the inside of curb or pavement. A suitable planting mixture of fifty/fifty (50/50), sixty/forty (60/40) (sand/topsoil) or as otherwise indicated by a Registered Landscape Architect, shall either be backfilled in place of native soil or efficiently mixed with the native soil to create optimum environment for successful root development. If native soil is to be mixed, it shall first be screened to remove rocks and debris larger than one-half (1/2) inch in diameter prior to mixing. All properties under this section shall be required to have an open bed inspection prior to backfilling to insure the thirty (30) inch depth has been met."

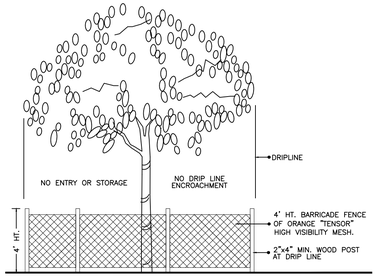
33. Root Prune notes:
   a. Root pruning shall be done whenever there will be grading, cutting or compaction disturbance underneath the drip line of a tree. Prior to any work within drip line, contractors should contact Landscape Architect to coordinate work. Root pruning shall be done prior to disturbance of the site. No disturbance shall be done within a distance of 3x the diameter of the tree, due to stability concerns.
   b. Before disturbance, meet with Landscape Architect on site to confirm location of root pruning. Root pruning shall be conducted at an agreed upon location. This location will be marked on the ground between the disturbance and the tree, typically 6" closer to the tree than edge the disturbance.
   c. All roots 3/4"-1.5"diameters must be pruned. If 2.5" or larger roots are encountered, stop pruning in that area and contact Landscape Architect. Root pruning shall only be as deep as necessary to ensure the cutting of all roots which would be impacted by the disturbance.
   d. Root pruning shall be done with a sharp tool, in such a way that does not pull on the roots, but leaves smooth cuts. It is preferable to expose the roots prior to root pruning. After pruning, fill the area with quality topsoil and water until thoroughly soaked.
   e. Once exposed, roots must be covered within 8 hours. If roots will be left exposed for longer than 8 hours, they must be kept moist. One option is to put moist burlap over the exposed roots. Hydrate root prune trench to maintain moisture as necessary until relocation of plant material.
   f. Root pruning shall be done by or under the supervision of an ISA Certified Arborist, and meet or exceed ANSI A300 or approved Tree Care Industry Standards. A certified arborist must be onsite during the entirety of root pruning.
   g. All root pruning shall be done per ANSI A300



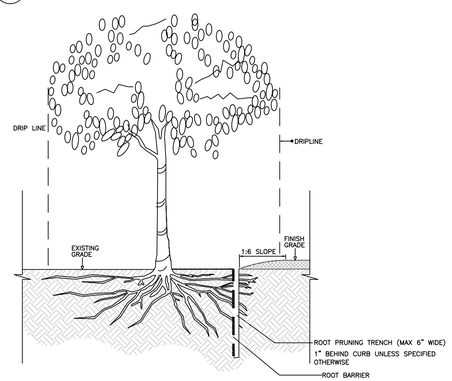
(2" cal. and over) 1 LARGE TREE PLANTING DETAIL
N.T.S.



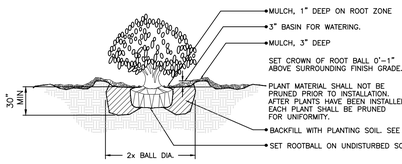
SABAL PALM PLANTING DETAIL 2
N.T.S.



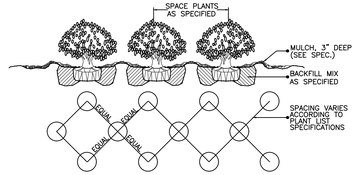
TREE PRESERVATION BARRICADE FENCING DETAIL 3
N.T.S.



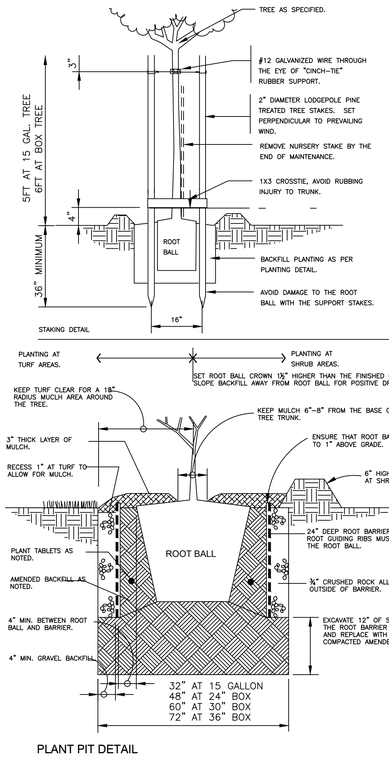
TREES TO REMAIN ROOT PRUNING DETAIL 4
N.T.S.



5 SHRUB PLANTING DETAIL
N.T.S.

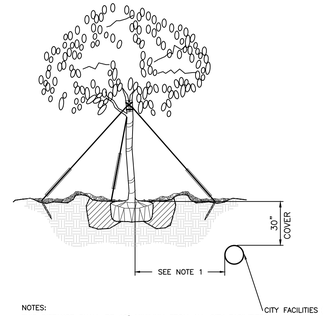


SHRUB / GROUNDCOVER SPACING / PLANTING DETAIL 6
N.T.S.



PLANT PIT DETAIL

ROOT BARRIER TREE PLANTING 7
N.T.S.

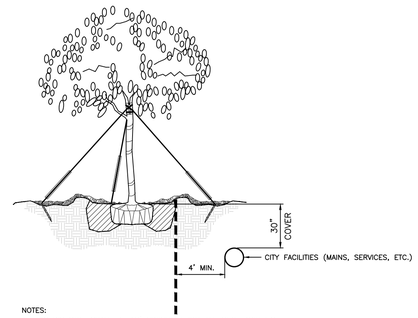


NOTES:
THIS DISTANCE SHALL BE 10' MINIMUM FROM ALL CITY FACILITIES IF NO ROOT BARRIER IS USED.

This item has been digitally signed and sealed by Brian R. Shore, PLA on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

TYP. TREE WITHOUT ROOT BARRIER 8
N.T.S.



NOTES:
1. THIS DISTANCE SHALL BE 10' MINIMUM FROM ALL CITY FACILITIES IF NO ROOT BARRIER IS USED.
2. THE INSTALLATION OF ROOT BARRIERS SHALL BE COORDINATED WITH CITY AND INSPECTED BY CITY PRIOR TO BACKFILLING. ALL ROOT BARRIERS SHALL EXTEND UP TO FINISH GRADE.
3. ROOT BARRIERS SHALL BE MINIMUM 36" DEEP. APPROVED PRODUCTS INCLUDE "DEEP ROOT" AND "ROOT SOLUTIONS". FLEXIBLE BARRIERS SHALL BE 36" PANELS MANUFACTURED BY BIOBARRIER.
4. ALL ROOT BARRIERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

TYP. TREE WITH ROOT BARRIER 8
N.T.S.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
REGISTERED LANDSCAPE ARCHITECT BRIAN R. SHORE LA 6666770 STATE OF FLORIDA
1/5/2022
Name : Brian R. Shore
License # : 6666770

Consultants :
MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

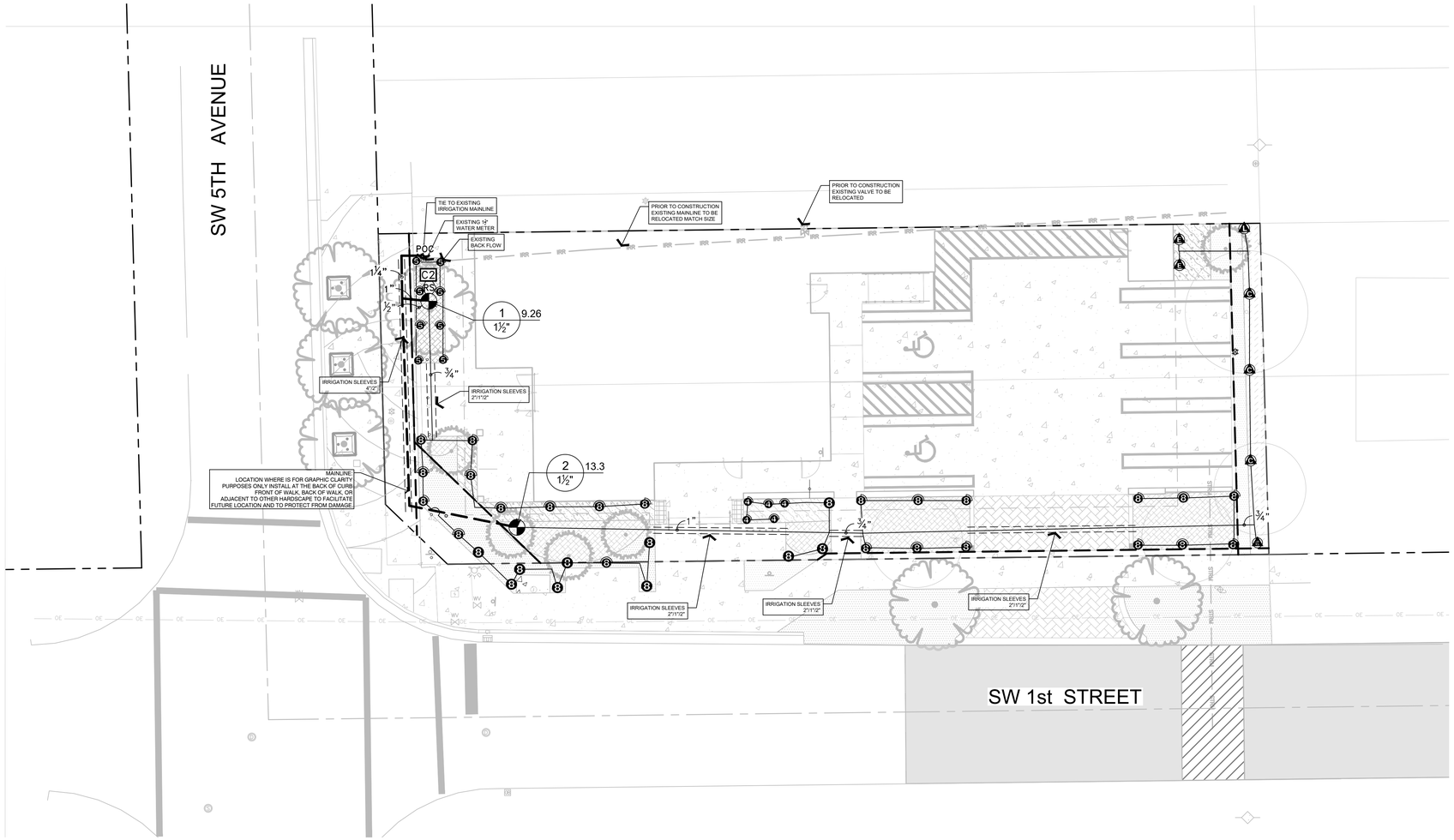
Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
LANDSCAPE NOTES AND DETAILS

Sheet # :
LNP.2



HORIZONTAL SCALE

0 5 10 20

(IN FEET)
1 INCH = 10 FEET

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
2Q 2H 4Q 4H 6Q 6H	Hunter PROS-04 short radius nozzles Turf Spray, 4.0" Pop-Up. Co-molded wiper seal with UV Resistant Material.	5	30
ES LCS RCS CS SS	Hunter PROS-04 5' strip spray Turf Spray, 4.0" Pop-Up. Co-molded wiper seal with UV Resistant Material.	8	30
Q H F	Hunter PROS-04 5' radius Turf Spray, 4.0" Pop-Up. Co-molded wiper seal with UV Resistant Material.	8	30
Q T H F	Hunter PROS-04 8' radius Turf Spray, 4.0" Pop-Up. Co-molded wiper seal with UV Resistant Material.	23	30
4 6 8 10 12 15 17	Hunter PROS-04 adjustable arc Turf Spray, 4.0" Pop-Up. Co-molded wiper seal with UV Resistant Material.	10	30

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	Hunter ICV-G 1", 1-1/2", 2", and 3" Plastic Electric Remote Control Valves, Globe Configuration, with NPT Threaded Inlet/Outlet, for Commercial/Municipal Use.	2
C2	Hunter XC-200 2 Station Controller, Residential Use. Plastic Cabinet, Outdoor, with 3 Independent Programs. 120 VAC.	1
RS	Hunter MINI-CLIK Rain Sensor, mount as noted	1
	Irrigation Lateral Line: Ductile Iron Pipe- Class 350	506.9 l.f.
	Irrigation Mainline: PVC Schedule 40	66.8 l.f.
	Pipe Sleeve: PVC Class 200 Typical pipe sleeve for irrigation pipe. Pipe sleeve size shall allow for irrigation piping and their related couplings to easily slide through sleeving material. Extend sleeves 18 inches beyond edges of paving or construction.	107.8 l.f.

Valve Callout
Valve Number
Valve Flow
#" Valve Size

PIPE SLEEVES SIZES
COM.WIRE SLEEVES
2"/ 2" SLEEVES

VALVE SCHEDULE

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PRECIP
1	Hunter ICV-G	1-1/2"	Turf Spray	9.26	33.93	1.5 in/h
2	Hunter ICV-G	1-1/2"	Turf Spray	13.32	36.6	1.43 in/h

IRRIGATION NOTES AND DETAILS ON IRR-2

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

This item has been digitally signed and sealed by Brian R. Shore, PLA on the date adjacent to the seal.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
REGISTERED LANDSCAPE ARCHITECT BRIAN R. SHORE LA 6666770 STATE OF FLORIDA
1/5/2022
Name : Brian R. Shore
License # : 6666770

Consultants :
MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

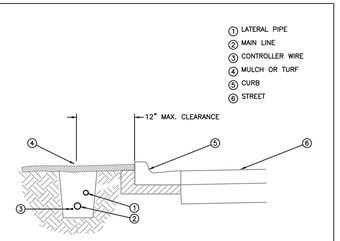
Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : RMG
Checked By : BRS

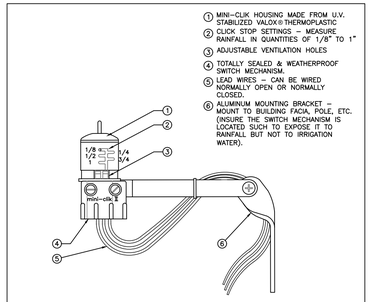
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
IRRIGATION PLAN

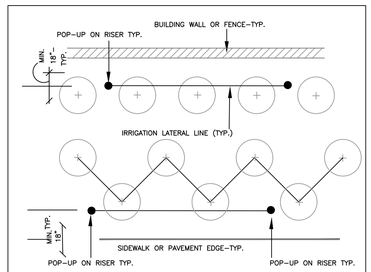
Sheet # :
IRR.1



1 MAINLINE AND LATERAL PIPING DETAIL

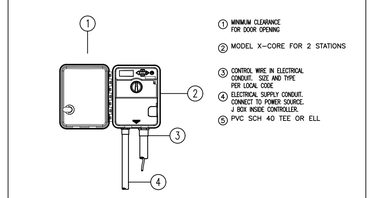


2 MINI-CLIK II RAIN SENSOR

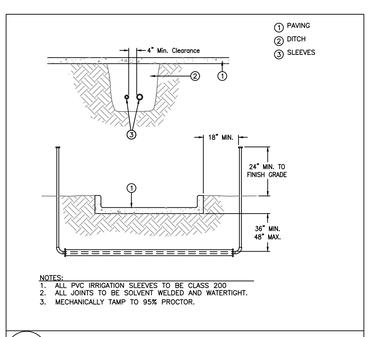


NOTE: THE DESIGN INTENT IS FOR THE RISERS TO BE INSIDE OF THE PLANT MASS TO OBSCURE IT FROM VIEW AND OFFER PROTECTION. THE TOP OF THE SPRAY HEAD SHOULD BE 4" BELOW THE MAINTAINED HEIGHT OF THE SHRUBBERY. THE SPRAY HEAD ON RISER SHOULD BE "INSET" INTO THE SHRUBS 6". THIS "INSET" DISTANCE IS THE CONTROLLING FACTOR. THEREFORE THE 18" MINIMUM DISTANCE FROM SIDEWALK/PAVEMENT IS APPROXIMATE ONLY.

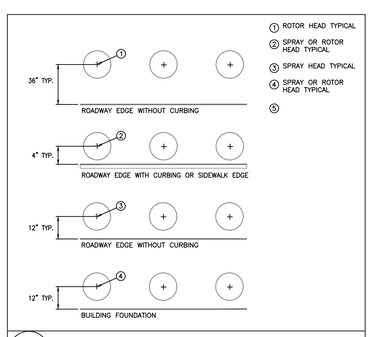
3 POP-UP HEAD ON RISER LOCATION DETAIL



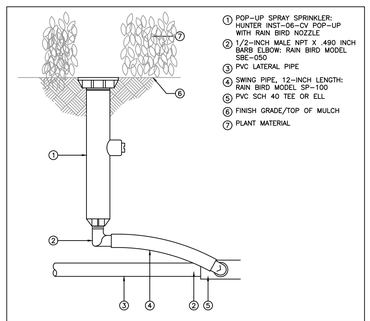
4 IRRIGATION CONTROLLER



5 SLEEVING



6 SPRINKLER PLACEMENT DETAIL



7 HUNTER INST-06-CV POP-UP

IRRIGATION NOTES.
The system has been designed to conform to the requirements of all applicable codes. Should any conflict exist, the requirements of the codes shall prevail. It is the responsibility of the owner/installation contractor to insure the entire system is installed according to all applicable laws, rules, regulations and conventions.

THE WORK
The work specified in this section consists of furnishing all components necessary for the installation, testing, and delivery of a complete, fully functional automatic landscape irrigation system that completely complies with the irrigation plans, specifications, notes, details and all applicable laws, regulations, codes and ordinances. This work shall include, but not be limited to, the providing of all required material (pipe, valves, fittings, controllers, wire, primer, glue, etc.), layout, protection to the public, excavation, assembly, installation, backfilling, compaction, repair of road surfaces, controller and low voltage feeds to valves, cleanup, maintenance, guarantee and as-built plans.
The system is designed to provide 100 % head to head coverage. Adjust sprinkler heads to minimize overspray onto roadways, buildings, walls, driveways, parking lots, etc.
Contractor shall verify all underground utilities 72 hours prior to commencement of work.
It is the responsibility of the irrigation contractor to familiarize himself with all grade differences, location of walls, retaining walls, structures and utilities. Do not willfully install the sprinkler system as shown on the drawings when it is obvious in the field that unknown obstructions, grade differences or differences in the area dimensions exist that might not have been considered in the engineering. Such obstructions, or differences, should be brought to the attention of the owners/authorized representative. In the event this notification is not performed, the irrigation contractor shall assume full responsibility for any revisions necessary.
Irrigation contractor shall repair or replace all items damaged by his work. He shall coordinate his work with other contractors for the location and installation of pipe sleeves and laterals through walls, under roadways and paving, etc.
The irrigation contractor shall take immediate steps to repair, replace, or restore all services to any utilities which are disrupted due to his operations. All costs involved in disruption of service and repairs due to negligence on the part of the irrigation contractor shall be his responsibility.
Contractor to verify these minimum conditions can be met prior to the beginning of installation. If the conditions can not be met, the irrigation contractor must notify the designer prior to proceeding with the work. If the irrigation contractor does not do so, he proceeds at his own risk and becomes responsible for any future work required to make the system perform as required.

THE PIPE

Pipe locations shown on the plan are schematic and shall be adjusted in the field. When laying out main and lateral lines locate pipe near edges of pavement or against buildings whenever possible to allow space for plant root balls. Pipes are to always be placed in planting beds. If it is necessary to have piping under hardscapes, such as roads, walks, and patios, the pipes must be sleeved using Sch 40 PVC with the sleeve diameter being twice the size of the pipe it is carrying. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes shall be permitted, but substitutions of larger sizes may be approved. All damaged and rejected pipe shall be removed from the site at the time of said rejection.
Mainline shall be Schedule Class 200 PVC solvent weld with Schedule 40 PVC fittings.
PVC pipe joint compound and primer: slow-drying, heavy-duty cement and tinted (purple) primer that is compatible with the cement. The PVC cement shall be Weld-On 2711 grey and the primer shall be Weld-On P70 purple primer, or approved equals.

VALVES

Sequence all valves so that the furthest valve from the P.O.C. operates first and the closest to the P.O.C. operates last. The closest valve to the P.O.C. should be the last valve in the programmed sequence.
Valve boxes must be placed a minimum of 12" and a maximum of 15" from the edge of pavement, curbs, etc. and the top of the box must be 2" above finish grade. Valve boxes shall be installed in shrub beds. No valve boxes shall be installed in turf areas without approval by the irrigation designer. Using 3" high number stencils paint the valve number in white on the lid of each valve box.

WIRING

Irrigation control wire shall be thermoplastic solid copper, single conductor, low voltage irrigation controller wire; suitable for direct burial and continuous operation at rated voltages.
Tape and bundle control wires every 10' and run alongside the mainline. At all turns in direction make a 2" coil of wire. At all valves boxes coil wire around a ¾" piece of PVC pipe to make a coil using 30 linear inches of wire. Make electrical connections with 3M-DBY connectors.
Number all wires, using an electrical book of numbers, according to the plans. Number wire in all valve boxes, junction boxes and at the controller.
Wire sized, numbered and colored as follows:
#14 white for common
#14 red for hot wire
#14 yellow for spares (provide 1 spare for every 10 hot wires)
(Minimum of 2 extra)
Controller grounding - drive three (3) 5/8'x8" copper clad grounding rods into the ground. The rod layout should be a triangular pattern with an 8" separation between rods. The top of each rod should be at least 6" below finished grade. Tie the rods together using #10 gauge bare copper wire. Attach wire to grounding rods using a brass clamp (one clamp per wire). Connect this grounding triangle to the controller using #10 gauge bare copper wire. Connect at grounding terminal. Each grounding rod shall be placed in a 12" rectangular valve box.

EQUIPMENT

Shrub heads shall be installed on ½" Sch 40 PVC risers. Shrub heads shall be installed to a standard height of 6" above plants and shall be installed within planted masses to be less visible. Bubblers shall be installed using Sch 80 nipples and shall be place at the base of trees for low level watering. Paint all shrub risers with flat black, or forest green paint.
All pop-up heads and shrub heads shall be pressure compensating. All pop-up heads shall be mounted on flex-type swing joints.
All sprinkler equipment, not otherwise detailed or specified, shall be installed as per manufacturer's recommendations and specifications, and according to local and state laws.

LAY-OUT

Lay out irrigation system main and lateral lines. Make the necessary adjustments as required to take into account all site obstructions and limitations prior to excavating trenches.
Stake all sprinkler head locations. Adjust locations and make the necessary modifications to nozzle types, etc. required to insure 100% head to head coverage.
Locate valves prior to excavation. Insure that their location provides for easy access and that there are no interference's with physical structures, plants, trees, poles, etc.

TRENCHING

Excavate straight and vertical trenches with smooth, flat or sloping bottoms. Trench width and depth should be sufficient to allow for the proper vertical and horizontal separation between piping, as shown in the pipe installation detail on the Detail Sheet.
Protect existing landscaped areas. Remove and replant any damaged plant material upon job completion. The replacement material shall be of the same genus and species, and of the size of the material it is replacing. The final determination as to what needs to be replaced and the acceptability of the replacement material shall be solely up to the owner or owner's representative.

INSTALLATION

Cut all pipes square and deburr. Clean pipe and fittings of foreign material. Apply a small amount of primer while ensuring that any excess is wiped off immediately. Primer should not puddle or drip from pipe or fittings. Next apply a thin coat of PVC cement - first apply a thin layer to the pipe, next a thin layer inside the fitting, and finally another very thin layer on the pipe. Insert the pipe into the fitting. Insure that the pipe is inserted to the bottom of the fitting, then turn the pipe a ¼ turn and hold for 10 seconds. Make sure that the pipe doesn't recede from the fitting. If the pipe isn't at the bottom of the fitting upon completion, the glue joint is unacceptable and must be discarded.
Pipes must cure a minimum of 30 minutes prior to handling and placing into trenches. A longer curing time may be required; refer to the manufacturer's specifications. The pipe must cure a minimum of 24 hours prior to filling with water.

BACKFILL
Pipe shall be installed so the following minimum backfill depths are maintained: 24" for all sleeving, 18" for the main line and 12" for all laterals.
Backfill shall be of suitable material free of rocks, stones, or other debris that is large than ½" in diameter.

FLUSHING
Prior to the placement of heads, flush all lines for a minimum of 10 minutes or until lines are completely clean of debris, whichever is longer.
Use screens in heads and adjust heads for proper coverage avoiding excess water on walls, walks, and paving.

TESTING
Remove all remote control valves and cap using a threaded cap. Fill mainline with water and pressurize the system to 125 PSI. Monitor the system pressure at two gauge locations - the locations must be at opposite ends of the mainline. With the same respective pressure, monitor the gauges for two hours. There can be no loss in pressure at either gauge. If a loss of pressure occurs, find the leak; repair it; wait 24 hours and retry the test. This procedure must be followed until the mainline passes the test.
The lateral lines must be billed and visually checked for leaks. Any leaks detected must be repaired. Not pressure test of the lateral lines is required.
Once the mainline and lateral lines have passed their respective tests, and the system is completely operational, a coverage test and demonstration of the system is required. The irrigation contractor must demonstrate to the owner, or his/her representative that proper coverage is obtained ant that the system works automatically form the controller. This demonstration requires that each zone be turned on, in the proper sequence as shown on the plans, from the controller. Each zone with is inspected for proper coverage and function. The determination of proper coverage and function is at the sole discretion of the owner, or owner's representative.
Operational testing - Upon completion of backfilling, finish grading and contouring, test the entire system for proper operation; including electrically actuating the remote control valves. Run each zone until water begins to puddle or run off. This will allow the irrigation contractor to determine the number of start times necessary to meet the weekly evapotranspiration requirements of the planting material in each zone. In sandy soils no puddling will occur, instead, calculate the required run times.

SUBMITTALS
The irrigation contractor must submit for approval, prior to installation, copies of the manufacturer" cut sheets/specifications for all components to be used in the irrigation system.
After project completion, and as a condition of final acceptance, the irrigation contractor shall provide the owner with a high quality, accurate, and legible set of as-built drawings. The as-builts must identify all remote control valves, gate valves, ball valves, splice boxes, controllers, mainline, sleeving, and low voltage wiring. To locate each item two dimensions from fixed objects of a permanent nature must be taken and noted on the as-builts. The irrigation contractor must also provide accurate, informative, and easy to follow and understand operation and maintenance manuals for all components of the irrigation system.
Controller charts - upon completion of "as-builts" prepare controller charts: one per controller. Indicate on each chart the area controlled by a remote control valve (using a different color for each zone). This chart shall be reduced to a size that will fit inside of the controller door. The reduction shall be hermetically sealed inside two 2ml pieces of clear plastic.

FINAL ACCEPTANCE
Final acceptance of the irrigation system will be given after the following documents and conditions have been completed and approved. Final payment will not be released until these conditions are satisfied.
1. Final walk-thru and correction of all punch items.
2. Completion and acceptance of "as-built" drawings.
3. Acceptance of required controller charts and placement inside of controllers.
4. Turn over of all required parts and tools as outlined in the project specifications.

GUARANTEE
The irrigation system(s) shall be guaranteed for a minimum of one calendar year from the time of final acceptance.
CONTROLLER
The irrigation controller shall be a Hunter/Rainbird which are located within the POC enclosure contractor to verify in working condition located in the pump enclosure with rain sensor under a grill on top of the enclosure. The controller zones shall be pre-wired to outside the pump enclosure and labeled with each zone number.

ML PROJECT No. 19-00014

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

This item has been digitally signed and sealed by Brian R. Shore, PLA on the date adjacent to the seal.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
REGISTERED LANDSCAPE ARCHITECT BRIAN R. SHORE LA 6666770 STATE OF FLORIDA
1/5/2022
Name : Brian R. Shore
License # : 6666770

Consultants :
MILLER LEGG
South Florida Office: 5747 N. Andrews Way
Ft. Lauderdale, Florida 33309-2364
954-436-7000
www.millerlegg.com
Certificates of Authorization: EB7318, LB6680, LC0337

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING
95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18063
ML Project No: 19-00014
Drawn By : RMS
Checked By : BRS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
IRRIGATION NOTES AND DETAILS

Sheet # :
IRR.2

STANDARD ABBREVIATIONS

A.B.	Anchor Bolt
ADJ.	Adjacent
ARCH.	Architect
BOT.	Bottom
BEW	Bottom Each Way
BLDG	Building
BM	Beam
BP	Base Plate
CFW	Continuous Fillet Weld
DIAG.	Diagonal
DIA.	Diameter
DIM	Dimension
DJ	Double Joist
DWG	Drawing
DWL	Dowel
EA.	Each
EE	Each End
EF	Each Face
EJ	Expansion Joint
EW	Each Way
EWB	Each Way Bottom
EWT	Each Way Top
EL	Elevation
ELECT	Electrical
EQ	Equal
EXIST	Existing
EXT	External
FF	Far Face
FDN	Foundation
FFL	Finished structural floor level
FIN	Finished
FL	Floor
FTG	Footing
GA	Gauge
GALV	Galvanized
HORI	Horizontal
HD	Holding Down
HT	Hip/Valley truss
INT	Interior
JT	Joint
KIPS	Kilopounds, Kips
KLF	Kilopounds per foot
L	Angle (e.g. L4x4x1/4)
LBS	Pounds
LG	Long
LONG	Longitudinal
MAX	Maximum
MECH	Mechanical
MEZZ	Mezzanine
MIN	Minimum
MISC	Miscellaneous
N-S	North-South
NTS	Not to Scale
NO.	Number
NW	Normal weight
O/C	On Center (C/C)
O.D.	Outside Diameter
PL.	Plate
PC	Precast
PROJ	Projection
PSI	Pounds per square inch
PSF	Pounds per square foot
PLF	Pounds per linear foot
RC	Reinforced concrete
REINF	Reinforcement (steel)
REQ'D	Required
REV	Revision
SPEC	Specification
HSS	Hollow Steel Section
ST	Steel
STD	Standard
SQ	Square
STRUCT	Structural
T	Top
TYP	Typical
TRANS	Transverse
TOB	Top of Beam
TOW	Top of wall
U/S	Underside
UNO	Unless noted otherwise
VERT	Vertical
WWR	Welded Wire Rebar

DESIGN LOADING PER FBC 2017, WIND LOADS PER ASCE 7 10

ROOF LIVE LOAD = 20 PSF FLOOR LIVE LOAD = 50 PSF
ROOF SUPERIMPOSED DEAD LOAD = 20 PSF
FLOOR SUPERIMPOSED DEAD LOAD = 20 PSF

ULTIMATE WIND SPEED = 170 MPH (132 MPH ASD) (132 MPH ASD)
RISK CATEGORY II BUILDING: ENCLOSED
WIND EXPOSURE = EXPOSURE C
WIND DIRECTIONALITY FACTOR Kd = 0.85
INTERNAL PRESSURE COEFFICIENT = +/- 0.18
ULT WIND PRESSURE = 58.1 PSF

CONCENTRATED LIVE LOAD PER ASCE 7-16:

OFFICE LOAD P= 2000 LBS
ROOF LOAD P= 300 LBS

SNOW LOAD PER ASCE 7-16:

GROUND SNOW LOAD = 0 PSF PER FIGURE 7.2-1.

RAIN LOAD PER ASCE 7-16:

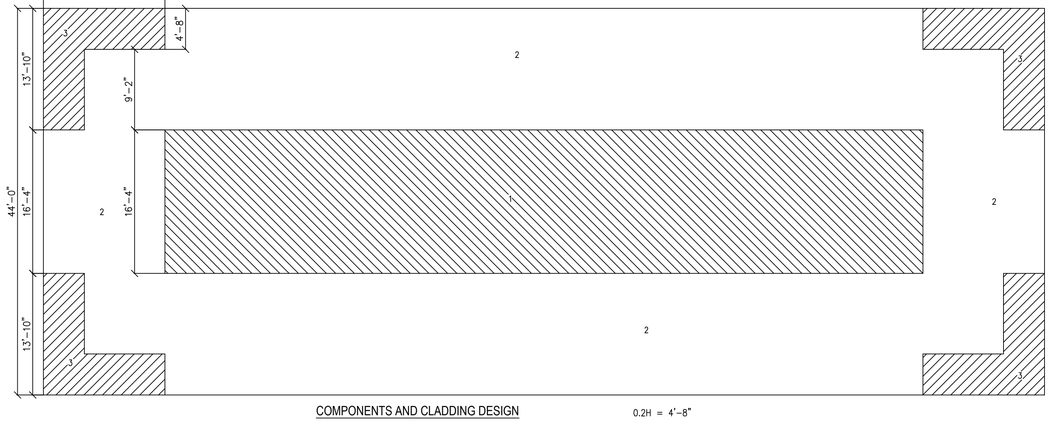
RAINFALL INTENSITY = 10 INCH/HOUR
FOR 15-MIN DURATION/100 YEAR RETURN PERIOD

R = 5.2 (Ds + Dh)

Ds = HYDRAULIC HEAD FOR SECONDARY SYSTEM
Dh = HYDRAULIC HEAD DUE TO FLOW
ROOF SLOPE = 1:48 (1.19 DEGREES)
ROOF SLOPE = 1:12 (4.76 DEGREES)

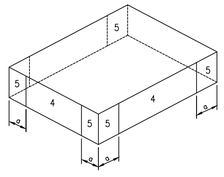
EARTHQUAKE LOAD PER ASCE 7-16:

RISK CATEGORY II
SITE CLASS C D E
vs = 600-1200 ft/s
N, Nch = 15-50 BLOWS/FT
su = 1000-2000 psf
Fa = 1.60 Fv = 2.40 Ss = 0.056
S1 = 0.0293 Sms = 0.09 Sm1= 0.07
IMPORTANCE FACTOR Table 1.5-2 = 1
SEISMIC DESIGN CATEGORY (Table 11.6-1,2) = A
SEISMIC BASE SHEAR
Cs =0.01 W = 0.00 K
SEISMIC BASE SHEAR V = 0.01 K



COMPONENTS AND CLADDING DESIGN
ROOF WIND ZONES:

0.2H = 4'-8"
0.6H = 13'-10"



COMPONENTS AND CLADDING DESIGN
WALL WIND ZONES:
WALL WIND ZONE WIDTH a = 4'-6"

MASONRY

1. Structural masonry has been designed in accordance with the ACI Building Code Requirements for Masonry Structures (ACI 530/ASCE 5.
2. Concrete masonry construction shall conform to the ACI Specification for Masonry Structures (ACI 530.1/ASCE 6).
3. Concrete masonry construction shall have a minimum compressive strength (f'm) of 1900 psi at 28 days. Mortar shall be type S for interior non-load bearing walls. For all load bearing walls, mortar shall be type M or S proportioned in accordance with ASTM C270, with a 28 day compressive strength of 2150 psi minimum. Portland cement-lime without air entrainment shall be used in the mortar mix.
4. Masonry grout shall be a high slump mix having a minimum 28 day compressive strength of 2500 psi. Grout to conform to ASTM C-476. Concrete shall not be used in lieu of masonry grout.
5. Lap splices in reinforcing bars to be 48x bar diameter. See typical reinforced cmu wall detail.
6. Provide hot-dipped, 9 gauge min., ladder type horizontal joint reinforcement at 16" o.c. vertically unless otherwise noted, or at 8" spacing at the following locations:
   a. two bed joints above and below all openings, extending reinforcement a minimum 24" each side of opening.
   b. in parapets above the roof line,
   c. in all masonry walls below finish grade.
7. Masonry reinforcement shall extend from footing to tie, or bond, beam at top of wall (i.e to top of the parapet, typ).
8. Concrete masonry shall be laid in a running bond pattern.

PRECAST, PRESTRESSED CONCRETE JOISTS

1. Joist manufacturer/ designer shall design joists for the minimum loads shown on this drawing.
2. Concrete 28 day compressive stress shall be 6000 psi minimum for joists and soffit beams. Soffit beams and joists shall be cast in a manufacturing plant, not on site.

COMPONENT \ AREA	ROOF	2ND FLOOR	
ROOFING	2		
INSULATION	12		
PRESTRESSED JOISTS & 4" SLAB		70	
12" PRESTRESSED JOISTS & 4" SLAB	57		
CEILING AND LIGHTS	4	4	
MECH. DUCT	5	5	
FLOOR FINISH		6	
TOTAL DEAD LOAD	80	85	
LIVE LOAD	30	50	

TABLE 1: DEAD AND LIVE LOADS SCHEDULE
ALL LOADS IN POUNDS PER SQ. FT.

ROOF ZONE 1
2 ROOF ZONE 2
ROOF ZONE 3

AREA	ZONE		10 SF	50 SF
MAIN ROOF	ALL	PRESSURE psf	17	15
	1'	SUCTION psf	NA	
	1	SUCTION psf	-66	-64
	2	SUCTION psf	-86	-84
	3	SUCTION psf	-118	-113
OVERHANG	2	SUCTION psf	-86	-83
	3	SUCTION psf	-118	-112

TABLE 2: GROSS ROOF CLADDING ASD WIND LOADS

EFFECTIVE AREA OF COMPONENT/ OPENING (SQ. FT.)				
WALL ZONE	4&5	PRESSURE psf	49	48
	4	SUCTION psf	-53	-52
	5	SUCTION psf	-65	-63

TABLE 3: SERVICE (ASD) SUCTION/PRESSURE ON WALLS AND OPENINGS.

CONCRETE

1. Reinforced concrete has been designed in accordance with the Building Code Requirements for Structural Concrete (ACI 318) by the American Concrete Institute (ACI).
2. Slabs on grade shall be constructed in accordance with the Guide for Concrete Floor and Slab Construction (ACI 302.1R).
3. Mixing, transporting, and placing of concrete shall conform to the latest edition of the Specifications for Structural Concrete for Buildings (ACI 301). In case of a discrepancy, the plans and specifications shall govern.
4. Concrete in the following areas shall have sand fine aggregate and normal weight, angular, coarse aggregates conforming to ASTM C33, and Type I Portland cement conforming to ASTM C150, to the following specs:

Location	28 Day Concrete Compressive Strength	Air Content	Water/Cement Ratio, Maximum
Footings	4000 psi	Optional	0.55 no air 0.45 with air
Interior slab on grade	3000 psi	Optional	0.55 ensure proper curing
Beams and columns	4000 psi	Optional	0.45
Elevated cast in place slabs (ROOF and FLOOR)	4000 psi	Optional	0.50
Reinforced concrete subjected to salt spray and brackish water	5000 psi	5% +/- 1%	0.40

Maximum concrete slump shall be 6" without plasticizer and 9" with a plasticizer.
Maximum water/cement ratio for air entrainment (6% +/- 1%) shall be 0.45.
Pearock mixes are not to be used in slabs.

5. For heavily trafficked areas, concrete slab on grade to have attained a compressive strength of 2000 psi before traffic is allowed on the slab on grade.
6. Concrete compressive strength tests shall be performed in accordance with ASTM C39. The tests shall Copies of the test results shall be forwarded directly to the Structural Engineer.
7. Fly ash may be used as a pozzolan to replace up to 25% of the Portland cement in a concrete mix, subject to the approval of the Structural Engineer. Concrete mixes using fly ash shall be proportioned to account for the properties of the specific fly ash used and to account for the specific properties of the fly ash concrete thus resulting. The use of fly ash is at the option of the Contractor, not the concrete supplier.
8. Slump tests shall be made prior to the addition of plasticizer. Where concrete is placed by pumping methods, concrete for test cylinders and slump tests shall be taken at the point of final placement.
9. Place concrete in a manner so as to prevent segregation of the mix. Delay floating and troweling operations until the concrete has lost surface water sheen or all free water. Do not sprinkle free cement on the slab surface. Finishing of slab surfaces shall conform to the latest editions of ACI 302.1R and ACI 304R (Guide for Measuring, Mixing, Transporting and Placing Concrete) and the Specifications.
10. Protect the concrete surface between finishing operations on hot, dry days or any time plastic shrinkage cracks could develop by using wet burlap, plastic membranes or fogging. Protect concrete deck at all times from rain, hail, running water or other injurious effects.
11. Horizontal joints will not be permitted in concrete construction except as shown on the contract documents. Vertical joints shall occur at center of spans at locations approved by the Structural Engineer.
12. Construction joints shall be prepared by roughening the contact surface in an approved manner to a full amplitude of approximately 1/4 inch leaving the contact surface clean and free of laitance. Construction joints at locations other than that indicated on the drawings shall be submitted to the Structural Engineer for approval.
13. Conduit or pipe size (O.D.) shall not exceed 30% of the slab thickness and shall be placed midway between the top and and bottom reinforcing. Concentration of conduits or pipes shall be avoided except where detailed openings are provided. See the Florida Building Code 2017, Section 1925.3. Conduits are not allowed in elevated slabs.
14. Concrete cover/protection for nonprestressed reinforcement shall conform to the following:

Cast against and permanently exposed to earth	3.00"
Exposed to earth or weather:	
#5 bars and smaller	1.50"
#6 through #18 bars	2.00"
Not exposed to weather or in contact with ground:	
Slabs, walls, joist:	
#11 bars and smaller	0.75"
Beams, girders, columns:	
Primary reinforcement, ties, stirrups, spirals	1.50"

15. No unprotected aluminum shall be embedded in any concrete.
16. No holes or openings through foundation walls and/or footings without Structural Engineer's approval.
17. Provide 3/4 inch chamfers on all exposed corners of concrete except those abutting masonry.

REINFORCING STEEL

1. Reinforcing bar detailing, fabricating, and placing shall conform to the latest edition of the following standards: Specifications for Structural Concrete for Buildings (ACI 301), ACI Detailing Manual (SP66) The latest editions of Concrete Reinforcing Steel Institute's Reinforcing Bar Detailing and Placing Reinforcing Bars may also be used.
2. Reinforcing steel shall be deformed bars of new billet steel conforming to ASTM A615 and shall have a minimum yield strength of 60,000 psi.
3. Provide specified bar chairs and spacers as required to maintain concrete protection specified.
4. Reinforcement bars shall not be tack welded, welded, heated or cut unless indicated on the contract documents or approved by the Structural Engineer. Reinforcing steel shall not be field bent.
5. Reinforcing steel which is to be welded shall be reinforcement conforming to ASTM A706 "Low-Alloy Steel Deformed Bars for Concrete Reinforcement".
6. Welding of reinforcement bars, when approved by the Structural Engineer, shall conform to the latest edition of American Welding Society Standard D1.4. Electrodes for shop and field welding of reinforcement bars shall conform to ASTM A233, Class E90XX.
7. Welded wire fabric shall be smooth wire fabric conforming to ASTM A185 unless otherwise noted. Welded wire fabric in slabs on grade shall be placed 2 inches down from the top of the slab unless otherwise noted.
8. Lap to reinforcing bars shall be 48x bar diameter typically.

NON-SHRINK GROUT

1. Grout to base plates shall be a high early strength, non-metallic, shrinkage resistant (when tested in accordance with the latest edition of ASTM C1107 or CRD-C621), premixed, non-corrosive, non-staining product containing Portland Cement, silica sands, shrinkage compensating agents and fluidity improving compounds.
2. Grout shall have a minimum compressive strength (f'c) of 6,500 psi in 28 days.
3. Grout compressive strength tests shall be performed in accordance with ASTM C109, with a restraining plate placed over the molds.

COLD FORMED STEEL

1. Cold formed (light gauge) steel members shall be detailed and fabricated in accordance with the AISC Specification for the Design of Cold formed Steel Structural Members, latest edition.
2. Splicing of axially loaded members is not permitted. Studs and accessories shall conform to the requirements of ASTM A-653, minimum yield stress 33 ksi, and shall be designed by manufacturer/supplier.
3. Studs shall be braced in accordance with the manufacturer's specifications but not less than at four foot centers vertically.

GENERAL STRUCTURAL NOTES

GENERAL

1. The Structural Drawings shall be read in conjunction with the other Contract Documents which include, but are not limited to, Architectural, Site, Civil, Electrical and Mechanical Drawings, and the Specifications. Report any discrepancies between Contract Documents to the Architect before proceeding.
   These general notes are to be read in conjunction with the notes on other structural drawings.
2. All work shall be in accordance with the 2017 Florida Building Code, FBC, 6th Edition. All referenced standards and codes shall be as listed in the Florida Building Code 2017.
3. The structure has been designed for the in-service loads only. The methods, procedures, and sequences of construction are the responsibility of the Contractor. The Contractor shall provide and maintain all temporary systems to ensure the integrity of the structure at all stages of construction. All work shall be performed without damage to adjacent existing work.
4. Refer items on the structural drawings requiring clarifications to the Architect and Structural Engineer. Do NOT use scaled dimensions. In case of a discrepancy between dimensions and/or details on the contract documents, relating to new or existing construction, please notify the Architect and Engineer before proceeding.
5. Cover no work until the appropriate inspection has been completed.
6. Bidders for specialty and pre-engineered systems shall provide all components of these system, per the design criteria, that is most cost effective to the Owner. All clarifications must be obtained before bidding. The structural and architectural drawings show the intent of these pre-engineered, specialty systems. Any deviations from the structural and architectural drawings shall be reported to the structural EOR for adjustment of the Contract documents.
7. All specialty and pre-engineered systems shall be designed for the loads & load combinations of FBC 2017. The Specialty Engineer is responsible for structural design of the actual system provided and shall sign and seal the final design calculations and drawings submitted to the EOR and Building Department for approval. The Owner and Contractor are responsible for non-structural design approval of the actual system provided.
8. The Specialty Engineer shall be a Florida licensed Professional Engineer.

COORDINATION WITH OTHER TRADES

1. Where new work is to be fitted to old work, the Contractor shall check all dimensions and conditions in the field, and report any errors or discrepancies to the Structural Engineer prior to the fabrication and erection of any new members. The contractor has the responsibility for the correctness and fit of the new parts to the old part.
2. The Contractor shall coordinate and check all dimensions relating to architectural finishes, structural framing, mechanical openings, equipment, etc. The Structural Engineer and Architect shall be notified of any discrepancies before proceeding with work in any area under question.
3. Principal openings in the structure are indicated on the contract documents. Refer to the architectural, mechanical, electrical, and plumbing drawings for sleeves, curbs, inserts, etc. not herein indicated. The Contractor shall verify the location of sleeves, openings, embedded items, etc. and shall ensure that they are in place prior to the placement of the concrete. Openings in slabs with a maximum side dimension or diameter of 10 inches or less shall not require additional framing or reinforcement, unless noted otherwise. The Structural Engineer shall approve the location of sleeves or openings in structural members.
4. The Contractor shall relocate all mechanical piping, ducts, equipment, electrical conduits, wiring and plumbing as indicated which interfere with the proposed construction. Service shall be maintained to all equipment which is served by mechanical, electrical or plumbing conduit being relocated.
5. Water shall not be added to the concrete at the job site. It shall be the responsibility of the Contractor to coordinate pumpable and workable mix without the addition of water at the job site. The use of plasticizer, retardants and other additives shall be at the option of the Contractor subject to the approval of the Structural Engineer. Follow the recommendations of the manufacturer for the proper use of additives. Use of calcium chloride or other chloride bearing salts will not be permitted.
6. Provide openings for mechanical equipment and ducts in precast members. The Contractor shall verify size and location prior to precast fabrication. Mechanical openings shall be placed below concrete tie beams.
7. The Contractor shall install all permanent truss bracing as shown on the Truss Manufacturer's shop drawings.
8. Splicing of structural steel members where not detailed on the contract documents is prohibited without the prior approval of the Structural Engineer as to location, type of splice and connection to be made. Contractor shall be responsible for the coordination of such splices.
9. No openings to be placed in beam webs or flanges without Structural Engineer's approval.
10. Special inspection by a registered building inspector is required for the following work:
    Field welding, high strength bolting, masonry construction and concrete foundations.
11. All mechanical and electrical systems and their supports and attachments to the structure documented on the structural drawings are the responsibility of the specifying consultants, manufacturers and suppliers. Shop drawings shall show the attachment of these systems and their supports to the structure and all weights and dimensions of these systems.

FOUNDATIONS

1. Foundation excavations and soil related work shall be performed in accordance with the geotechnical report.
2. Foundation conditions noted during construction, which differ from those described in the geotechnical report shall be reported to the Structural Engineer before further construction is attempted.
3. Foundations and soils related work shall be inspected by a Licensed Geotechnical Engineer.
4. Excavations for spread footings, combined footings, continuous footings and/or mat foundations shall be cleaned and hand tamped to a uniform surface. If footings cannot be placed the same day excavations are opened, adequately protect the exposed material from detrimental change in conditions such as rain, disturbance or freezing. Surface runoff shall not be allowed to enter the excavation.
5. Contractor to verify dimensions, elevations and condition at every existing footing that will be used for new construction. Existing footing dimensions must correspond to those shown on plans. Contractor shall report any discrepancies to the Structural Engineer.
6. All abandoned footings, utilities, etc., that interfere with new construction shall be removed.
7. Earth forming of footings and slab on grade is not allowed.

Allowable soil bearing capacity = 2500 PSF
Modulus of subgrade reaction = 150 PCI

Compact each layer of backfill for footings/ building pad to not less than 98 percent Modified Proctor per ASTM D1557.91.

SHOP DRAWINGS

1. Submit shop drawings in a timely manner allowing adequate time for processing. Submit shop drawings for processing before fabricating.
2. All shop drawings must bear evidence of the Contractor's review and approval prior to submission to the Architect and/or Engineer.
3. The Contractor/Fabricator is responsible for all materials, quantities and dimensions shown on the shop drawings, and for the methods employed to erect these materials. Review by the Engineer shall be for design conformance only.
4. Substitutions shown on the shop drawings shall be of at least equal quality to the items specified in the Contract Documents and shall be at no extra cost to the Owner, unless prior written approval is obtained from the Architect and/or Engineer. Such approval shall be submitted with the shop drawings. The Contractor's review and forwarding of the shop drawings to the Architect/Engineer indicates the Contractor's approval and acceptance of all substitutions and/or changes submitted.
5. Concrete/ masonry shops shall detail all reinforcing steel in the concrete/ masonry construction, including all bent bars, vertical reinforcing and horizontal bond beam reinforcing. Submit plans, elevations and sections to clearly show all reinforcement fit and layout.
6. When a computer generated output is submitted for an item's design, the designer shall submit
   a. the name of the computer program used,
   b. the design assumptions used, and
   c. a summary of the output, indicating clearly the the conclusion(s) derived. Submission of computer generated outputs, without the clarifications above, may be returned unchecked.
6. Shop drawings for pre-engineered or specialty systems shall be signed, sealed and dated by the Florida licensed Professional Engineer responsible for their preparation.
7. The Specialty Engineer shall design for criteria shown on the structural construction drawings. If the design criteria is unclear, contact the Engineer of Record before proceeding with a design.

SYSTEMS TO BE DESIGNED BY SPECIALTY ENGINEER
PRECAST CONCRETE JOISTS and SOFFIT BEAMS
ALUMINUM SCREENS TO ROOF TOP EQUIPMENT

The steel/concrete joist design shall be coordinated with the as built masonry/concrete walls and erected steel framing.

8. Notice of Acceptance (NOA), or Florida Product Accetance (FPA) documents, for all items exposed to wind loads, shall be submitted to the Engineer of Record for review and to the Building Department for approval before these items are fabricated and installed. Installation without Building Department approval shall be at the Contractor's risk.

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

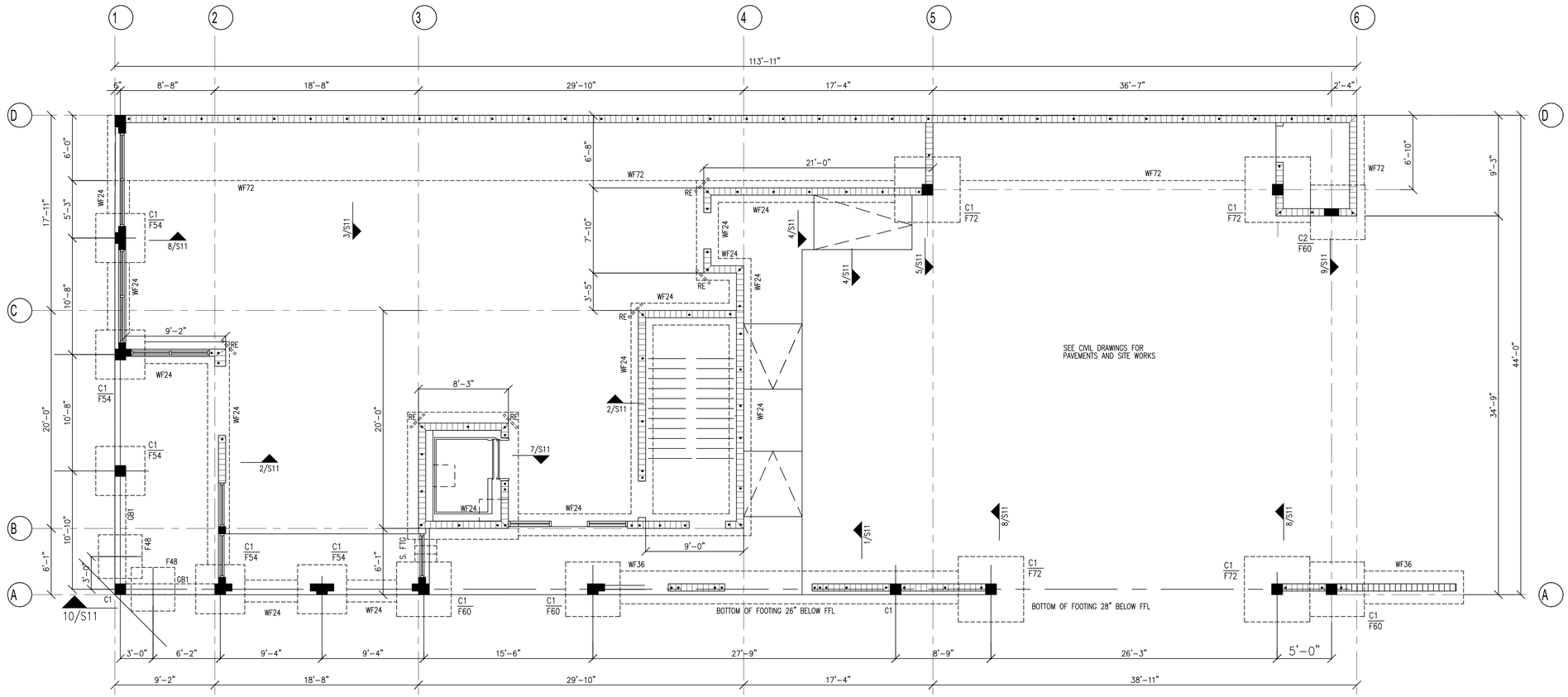
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

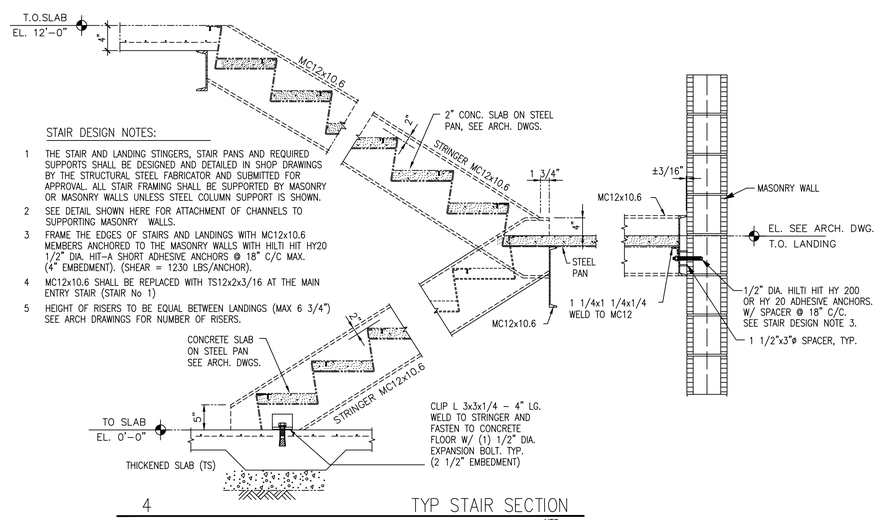
Sheet Title :
GENERAL NOTES AND DESIGN INFORMATION

Sheet # :
S0.1



FOUNDATION LAYOUT

SCALE 3/16" = 1'-0"



STAIR DESIGN NOTES:

1. THE STAIR AND LANDING STINGERS, STAIR PANS AND REQUIRED SUPPORTS SHALL BE DESIGNED AND DETAILED IN SHOP DRAWINGS BY THE STRUCTURAL STEEL FABRICATOR AND SUBMITTED FOR APPROVAL. ALL STAIR FRAMING SHALL BE SUPPORTED BY MASONRY OR MASONRY WALLS UNLESS STEEL COLUMN SUPPORT IS SHOWN.
2. SEE DETAIL SHOWN HERE FOR ATTACHMENT OF CHANNELS TO SUPPORTING MASONRY WALLS.
3. FRAME THE EDGES OF STAIRS AND LANDINGS WITH MC12x10.6 MEMBERS ANCHORED TO THE MASONRY WALLS WITH HILTI HIT HY20 1/2" DIA. HIT-A SHORT ADHESIVE ANCHORS @ 18" C/C MAX. (4" EMBEDMENT). (SHEAR = 1230 LBS/ANCHOR).
4. MC12x10.6 SHALL BE REPLACED WITH TS12x2x3/16 AT THE MAIN ENTRY STAIR (STAIR No 1)
5. HEIGHT OF RISERS TO BE EQUAL BETWEEN LANDINGS (MAX 6 3/4") SEE ARCH DRAWINGS FOR NUMBER OF RISERS.

4 TYP STAIR SECTION

NTS

LEGEND:

FOR GENERAL STRUCTURAL NOTES SEE DRAWING S01

- WF = CONTINUOUS FOOTING, SEE SCHEDULE.
- C1, C2 CONCRETE COLUMNS
- GB1 12"x20" DEEP GRADE BEAM, 6#8T, 3#8B, #3 STIRRUPS AT 6" O.C.
- S. FTG STEPPED FOOTING
- TOF TOP OF FOOTING
- BOF BOTTOM OF FOOTING
- CJ CONTROL JOINT IN SLAB
- RE = RE-ENTRANT BARS. 2#4 x 6'-0" LONG AT MIDDLE OF SLAB SECTION.
- REINFORCED MASONRY WALL

CONT. WALL FOOTING SCHEDULE		
MARK	FOOTING SIZE WxD	REINFORCING
WF24	2'-0"x12" CONT.	3-#5 L.W. CONT. + #5 @ 15" S.W. BOT.
WF36	6'-0"x12" CONT.	4-#5 L.W. CONT. + #5 @ 12" S.W. BOT.
WF72	6'-0"x16" CONT.	7-#5 L.W. CONT. + #5 @ 12" S.W. T&B

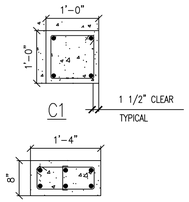
SPREAD FOOTING SCHEDULE			2500 PSF
MARK	FOOTING SIZE	REINFORCING	REMARKS
F36	3'-0"x3'-0"x48"	4#4 BOT. E.W.	
F48	4'-0"x4'-0"x12"	5#5 BOT. E.W.	
F54	4'-6"x4'-6"x12"	5#5 BOT. E.W.	
F60	5'-0"x5'-0"x13"	7#4 BOT. E.W.	
F72	6'-0"x6'-0"x14"	7#5 BOT. E.W.	

TOP OF FOOTINGS SHALL BE 12" BELOW GRADE OR FFL

CONCRETE COLUMN SCHEDULE				
MARK	SIZE	MAIN (VERTICAL) REINFORCING	#3 TIE SPACING	REMARKS
C1	12" x 12"	4#8	12"	
C2	8" x 16"	6#6	8"	

FOUNDATION PLAN NOTES:

1. ALLOWABLE NET SOIL BEARING CAPACITY = 2500 PSF. THE CONTRACTOR IS TO CONFIRM THIS BEFORE EXCAVATING.
2. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER.
3. SEE S11 FOR TYPICAL FOUNDATION DETAILS. TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS OTHERWISE NOTED.
4. F**... ETC INDICATES CONCRETE FOOTING. e.g. F36 INDICATES A FOOTING 36" SQUARE
5. VERIFY BEARING CAPACITY AT BOTTOM OF FOOTING EXCAVATIONS PRIOR TO PLACING CONCRETE. INSPECTOR TO VERIFY AND REPORT PLACEMENT OF REINFORCING STEEL PRIOR TO PLACEMENT OF CONCRETE.
6. REINFORCING AT CORNERS IN FOOTINGS PER DETAIL C/S11 TO MAINTAIN CONTINUOUS REINFORCING.
7. COORDINATE WITH OTHER CONTRACT DOCUMENTS FOR INSTALLATION OF ALL REQUIRED SLEEVES, INSERTS, ETC. UNDER THE CONCRETE FOOTINGS.
9. FOR SLAB ON GRADE DETAILS, SEE A/S11.
10. PROVIDE CONTROL JOINTS IN THE SLAB ON GRADE TO FORM NEAR SQUARE PANELS AS SHOWN.
11. CENTERLINE OF FOOTING TO MATCH CENTERLINE OF COLUMN UNO
12. MAINTAIN SLAB DEPTH AT SLOPED SLABS.
13. GROUT SOLID MASONRY BELOW FIRST FLOOR F.F.L.



Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 26263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FOUNDATION LAYOUT

Sheet # :
S10

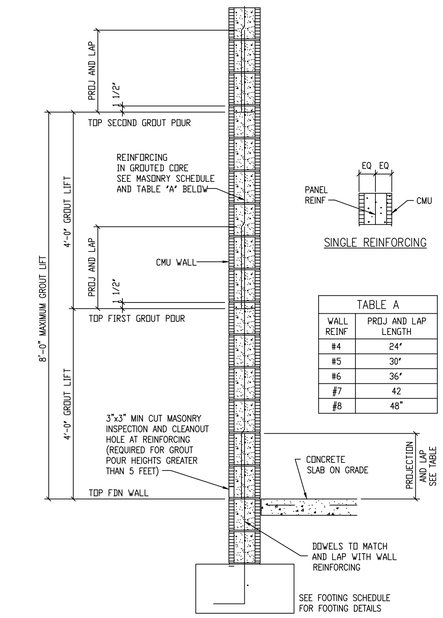
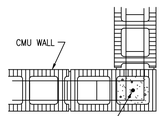


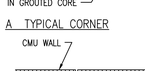
TABLE A	
WALL REINF	PROJ AND LAP LENGTH
#4	24"
#5	30"
#6	36"
#7	42
#8	48"

SINGLE REINFORCING

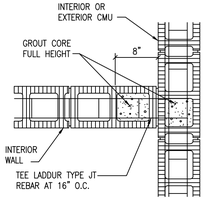
E TYPICAL REINFORCED CMU WALL
NTS



A TYPICAL CORNER



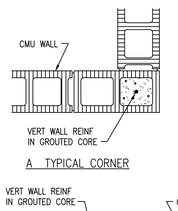
B TYPICAL JAMB



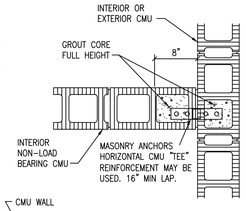
C TYPICAL INTERSECTION

NOTES:
1. REINFORCING SHOWN IS IN ADDITION TO REINFORCING SHOWN ON PLANS AND SPECIAL DETAILS
2. REINFORCING TO BE SAME SIZE AS ADJACENT WALL REINFORCING INDICATED ON PLANS

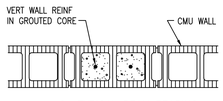
F CMU WALL DETAILS, TYP
NTS



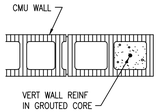
A TYPICAL CORNER



B TYPICAL INTERSECTION



C TYPICAL BEAM BEARING

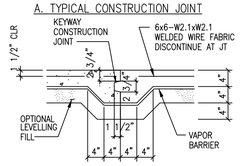


D TYPICAL JAMB

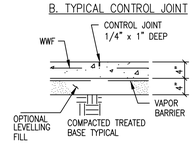
NOTES:
1. REINFORCING SHOWN IS IN ADDITION TO REINFORCING SHOWN ON PLANS AND SPECIAL DETAILS
2. REINFORCING TO BE SAME SIZE AS ADJACENT WALL REINFORCING INDICATED ON PLANS
3. TYPICAL DETAILS APPLIES TO ALL EXTERIOR WALLS AND INTERIOR LOAD BEARING WALLS

G CMU WALL DETAILS, TYP
NTS

A. TYPICAL CONSTRUCTION JOINT

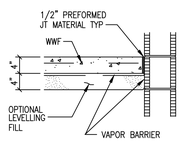


B. TYPICAL CONTROL JOINT

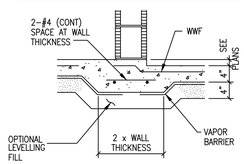


CONTROL JOINT PATTERN: FORM 12 FT MAXIMUM SQUARE OR NEAR SQUARE PANELS

C. TYPICAL SLAB AT WALL

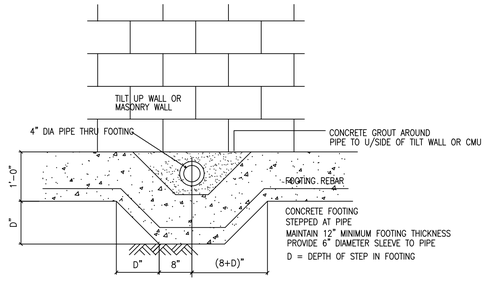


D. TYP DEPRESSED SLAB EDGE AT WALL

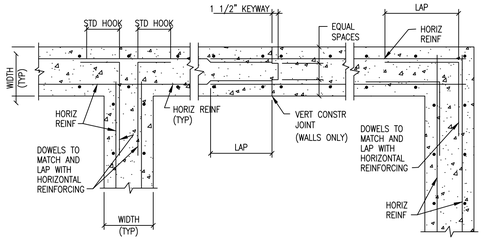


NOTES:
1. ALL CONCRETE FOR SLAB ON GRADE SHALL BE F'c = 3000 PSI AT 28 DAYS.
2. WELD WIRE FABRIC TO BE DEPRESSED OR LAPPED AT ALL DEPRESSIONS.

A TYPICAL 4" CONCRETE SLAB ON GRADE
NTS

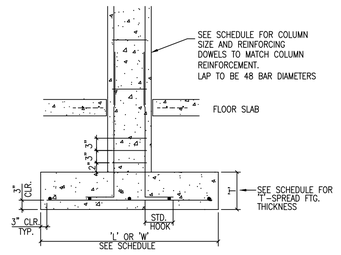


B DEPRESSED FOOTING AT PIPE DETAIL
NTS

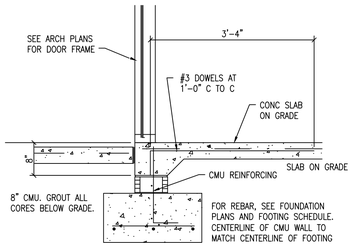


C TYPICAL CONCRETE REINFORCING
NTS

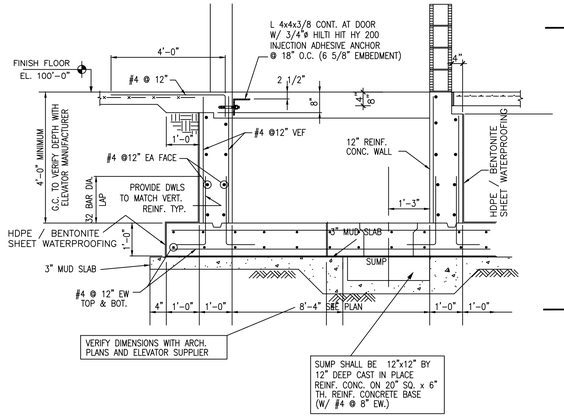
TO BE USED FOR FOOTING AND CONCRETE BEAM REINFORCEMENT LAYOUT



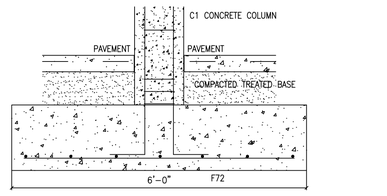
D COLUMN FOOTING DETAIL TYP
3/4" = 1'-0"



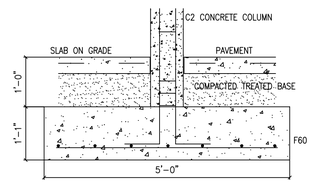
6 TYP. SLAB AT EXTERIOR DOORWAY
3/4" = 1'-0"



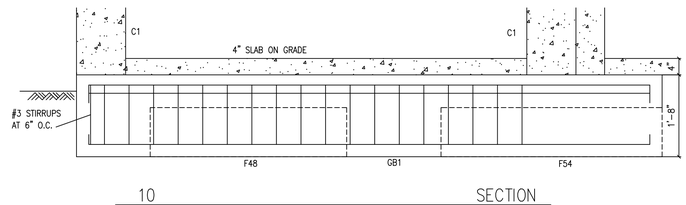
7 SECTION
3/4"=1'-0"



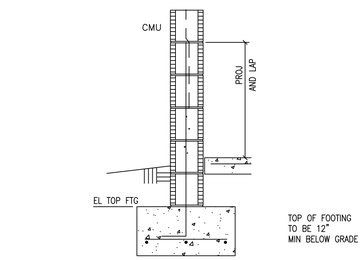
8 SECTION
3/4"=1'-0"



9 SECTION
3/4"=1'-0"

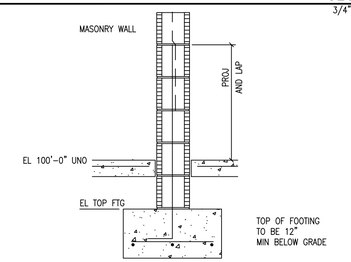


10 SECTION
3/4"=1'-0"

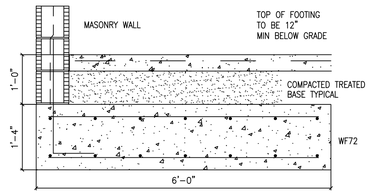


NOTES:
1. GROUT ALL CORES IN CMU BELOW FINISHED FLOOR PRIOR TO SLAB PLACEMENT
2. SEE FOUNDATION PLANS FOR WALL FOOTING MARK, SIZE AND ELEVATION
3. FOOTING MAY BE LOWERED OR STEPPED AT DOWN PIPE

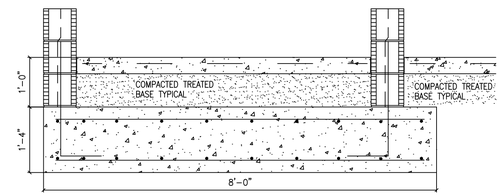
1 SECTION
3/4"=1'-0"



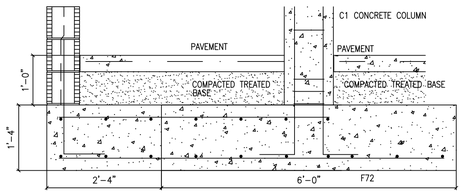
2 SECTION
3/4"=1'-0"



3 SECTION
3/4"=1'-0"



4 SECTION
3/4"=1'-0"



5 SECTION
3/4"=1'-0"

Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FOUNDATION DETAILS

Sheet # :
S11

FLOOR PLAN NOTES:

1. CONCRETE JOISTS BY JOIST MANUFACTURER PER PCI SPECS. PRE-ENGINEERED PRESTRESSED JOISTS TO BEAR ON BEARING PADS AND SPACED PER THE P.C. JOIST MANUFACTURER.
2. ROOF JOIST SHALL BE 16" DEEP PRESTRESSED, PRECAST CONCRETE JOISTS (J16) AT 4'-6" O.C. MAXIMUM UNO.
3. FLOOR SLAB: 4" NJW CAST IN PLACE REINFORCED CONCRETE SLAB WITH #3 AT 12" O.C. TOP AND BOTTOM, EACH WAY, 3/4" COVER.
4. WALLS SHOWN ARE BEARING WALLS AND NON-LOADBEARING WALLS UNDER THE LEVEL SHOWN. FOR WALLS ABOVE THIS LEVEL, SEE STRUCTURAL LEVEL ABOVE AND THE ARCHITECTURAL DRAWINGS.
5. SEE GENERAL STRUCTURAL NOTES ON S01.

LEGEND

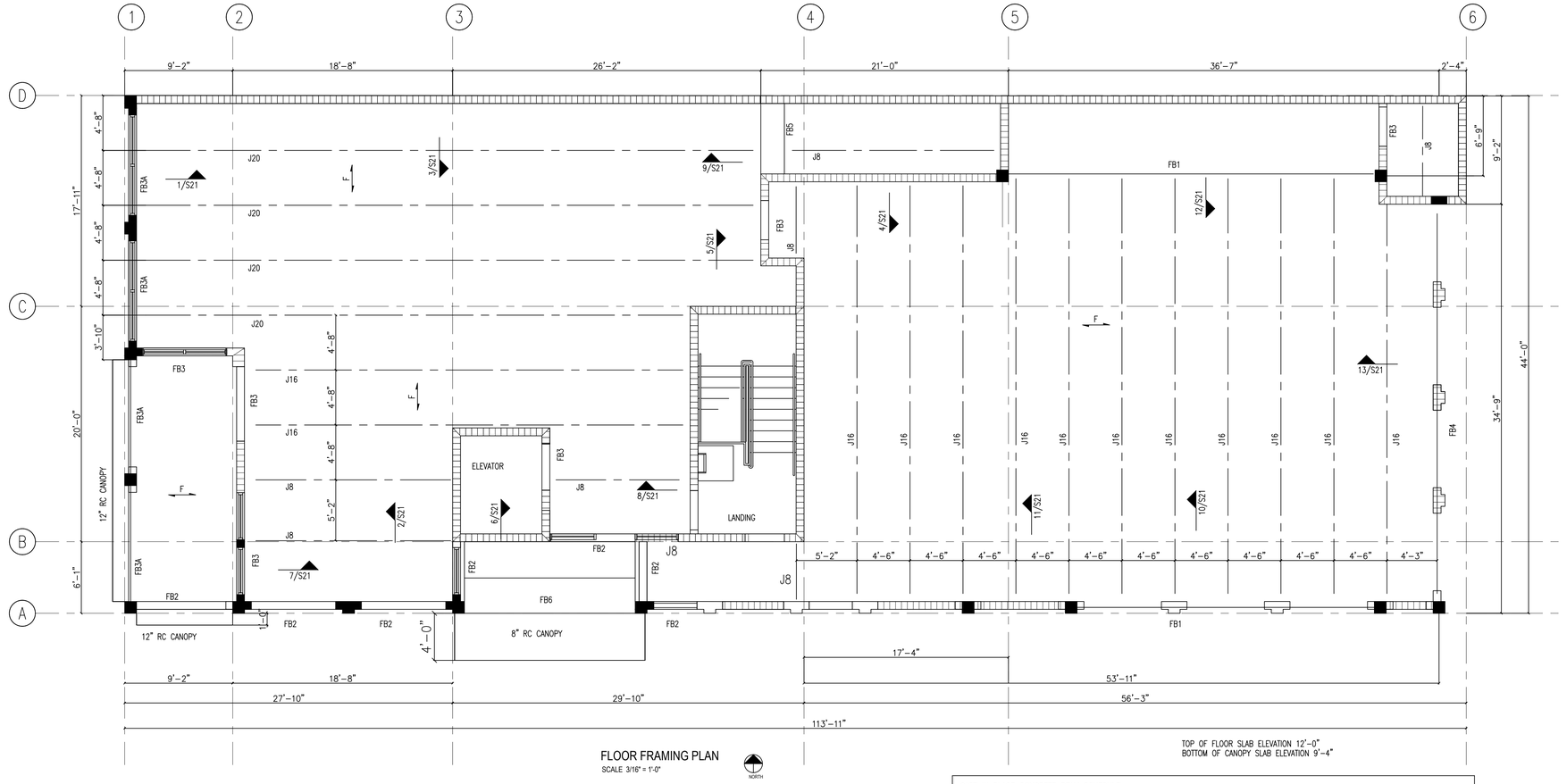
F — INDICATES DIRECTION OF FLOOR SPAN

J8 8" PRECAST JOIST

J16 12" PRECAST JOIST

J20 20" PRECAST JOIST

TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.



FLOOR FRAMING PLAN

SCALE 3/16" = 1'-0"

NORTH

TOP OF FLOOR SLAB ELEVATION 12'-0"
BOTTOM OF CANOPY SLAB ELEVATION 9'-4"

CAST IN PLACE CONCRETE BEAM SCHEDULE

MARK	SIZE BxD	TOP REBAR	BOTTOM REBAR	#3 STIRRUP SPACING, INCH	COMMENT	ULTIMATE MOMENT Kip-FT	ULTIMATE SHEAR Kips	SHEAR FRICTION BARS
FB1	16"x32"	4#6			SOFFIT BEAM	435	68	3#6
FB1A	16"x32"	4#8			SOFFIT BEAM	517	81	3#6
FB2	8"x32"	2#6	2#6	14				
FB3	16"x29 1/2"	3#6	2#6	14				
FB3A	16"x32"	3#6			SOFFIT BEAM	71	24	3#5
FB4	16"x32"	4#6			SOFFIT BEAM	424	50	3#6
FB5	24"x30 1/2"	3#6			SOFFIT BEAM	85	17	3#5
FB6	36"x8"	4#8	8#8		SLAB/BEAM			

PROVIDE 16" EMBEDMENT INTO EACH SOFFIT BEAM TO #5 SHEAR FRICTION BARS
PROVIDE 20" EMBEDMENT INTO EACH SOFFIT BEAM TO #6 SHEAR FRICTION BARS

Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

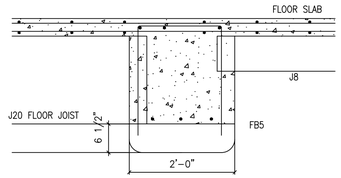
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

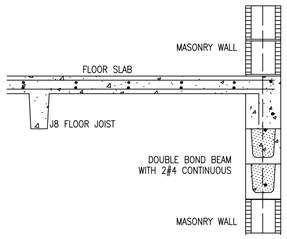
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR FRAMING PLAN

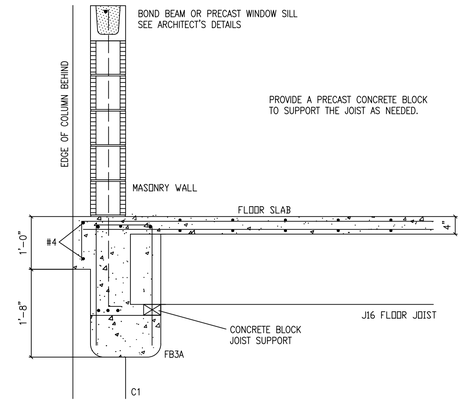
Sheet # :
S20



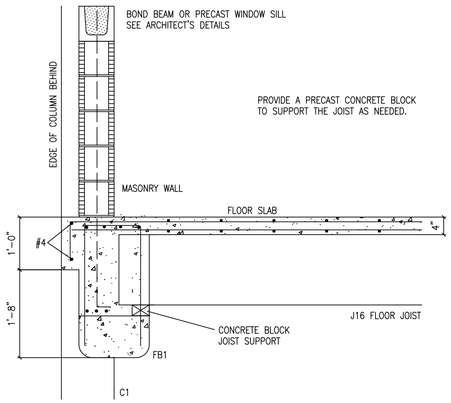
9 SECTION 3/4"=1'-0"



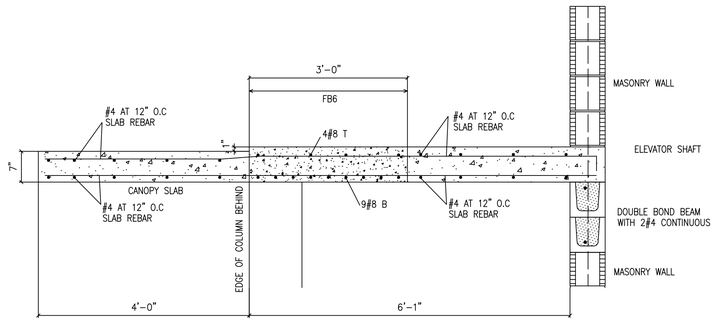
5 SECTION 3/4"=1'-0"



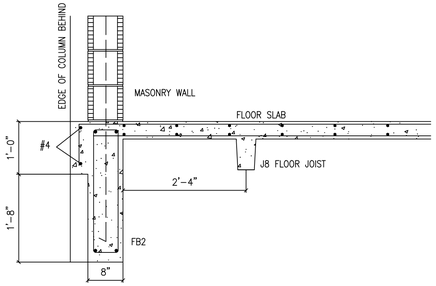
1 SECTION 3/4"=1'-0"



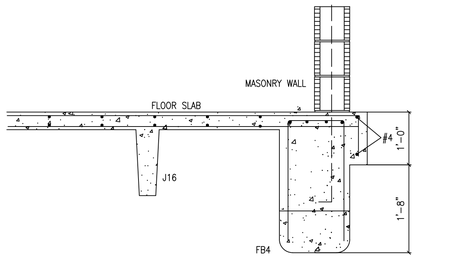
10 SECTION 3/4"=1'-0"



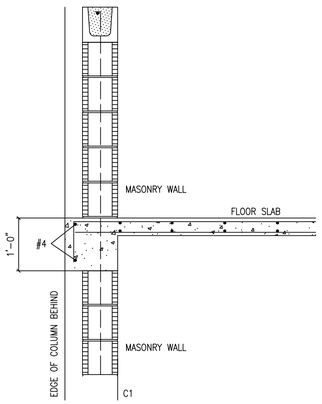
6 SECTION 3/4"=1'-0"



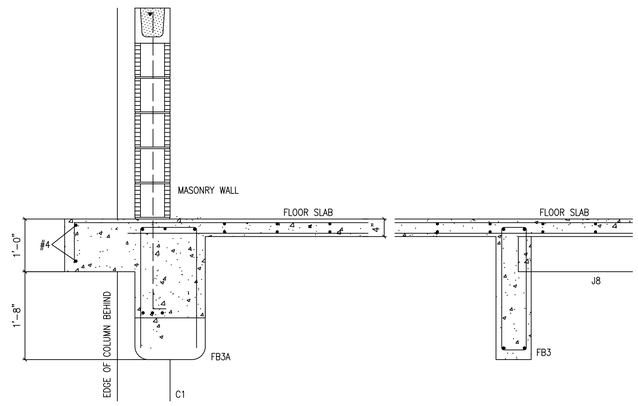
2 SECTION 3/4"=1'-0"



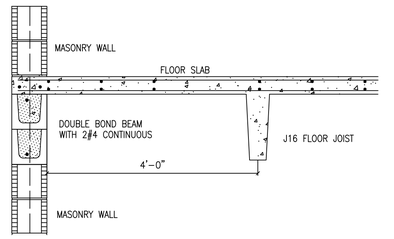
13 SECTION 3/4"=1'-0"



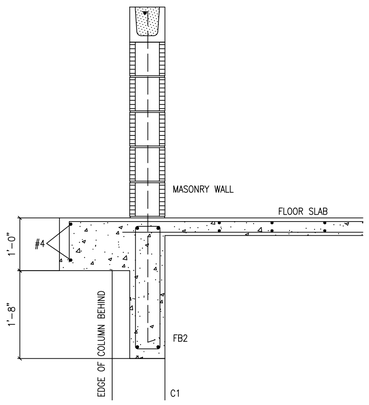
11 SECTION 3/4"=1'-0"



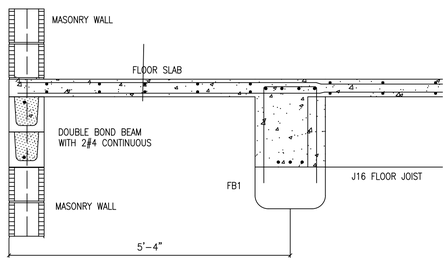
7 SECTION 3/4"=1'-0"



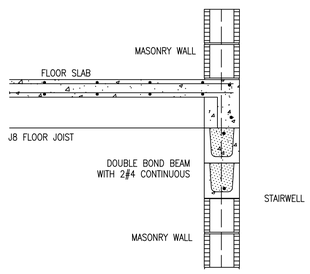
3 SECTION 3/4"=1'-0"



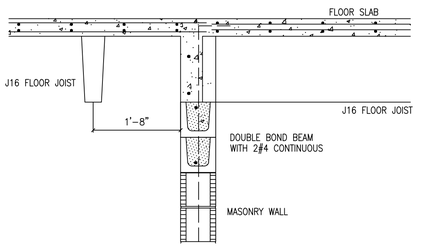
14 SECTION 3/4"=1'-0"



12 SECTION 3/4"=1'-0"



8 SECTION 3/4"=1'-0"



4 SECTION 3/4"=1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

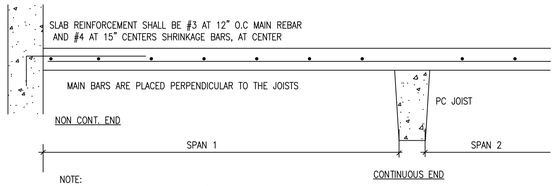
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

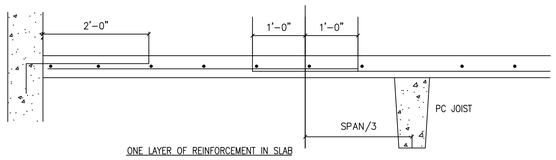
Sheet Title :
FLOOR SECTIONS AND DETAILS

Sheet # :
S21



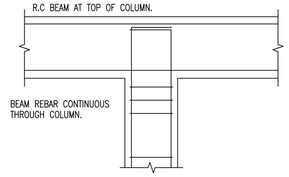
NOTE:
ELEVATED, ROOF SLAB SHALL BE 3" THICK, NORMAL WEIGHT CONCRETE WITH 6" AVERAGE CELLULAR CONCRETE TOPPING. MECH/ELEC CONSULTANT TO CONFIRM TOPPING THICKNESS. SEE PLANS FOR SLAB SUPPORT SPACING.

11 ELEVATED ROOF SLAB REINFORCEMENT DETAIL, TYP
NTS

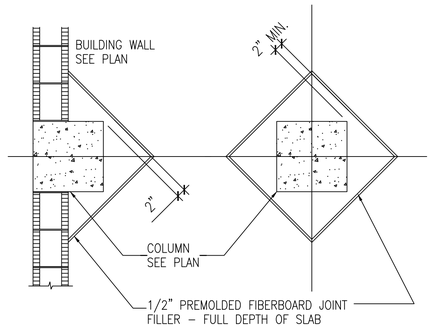


NOTE:
1. LENGTH OF LAP FOR #4 BARS SHALL BE 24 INCHES.
2. TRANSVERSE BARS MAY BE LAPPED AT ANY LOCATION

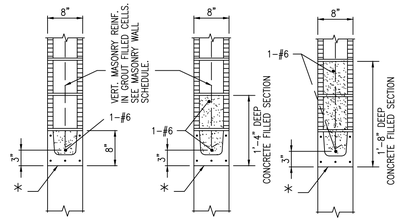
A LAPS FOR SLAB REINFORCEMENT
NTS



5A RC COLUMN DETAILS
TOP OF COLUMN AT CONTINUOUS BEAM
NTS



9 COLUMN ISOLATION JOINT DETAILS
NTS



* PRECAST CONCRETE LINTEL AS MANUFACTURED BY CAST-CRETE, OR APPROVED EQUAL. WITH 8" BEARING EACH END. ENDS TO HAVE 5 1/2" LONG x 4" WIDE NOTCH TO ACCOMODATE VERTICAL REINFORCING AND GROUTING. – TYPICAL.

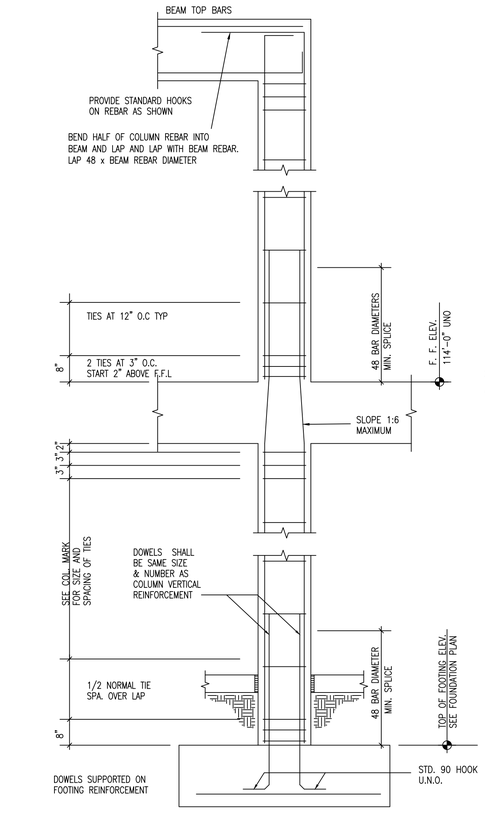
NOTES:
1. GROUT SOLID ALL MASONRY UNITS AS SHOWN.
2. ALL REINFORCING BARS HAVE STANDARD HOOKED AT THEIR ENDS
3. CMU SHALL BE 8" NORMAL WEIGHT LAID IN RUNNING BOND.
4. SHORE LINTEL UNTIL CONCRETE CURES (7 DAY MIN)

LINTEL SCHEDULE

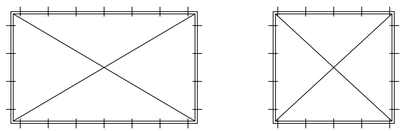
PLAN MARK	MAXIMUM OPENING WIDTH FT	CASTCRETE LINTEL DETAILS	ACTUAL LOADS PLF	ALLOWABLE LOADS PLF
L1	4'–0"	8F8, 1T	1100 –636	1969 G –1407 U
L2	8'–0"	8F16, 1T, 1B	1100 –636	1625 G –1133 U
L3	12'–0"	8F24, 1T, 1B	1100 –636	1838 G –962 U

1838 G: 1836 PLF VERTICAL GRAVITY LOAD
–962 U: 962 PLF UPLIFT LOAD

10 CONCRETE MASONRY LINTEL DETAILS
NTS



5 TYPICAL RC COLUMN DETAILS
NTS

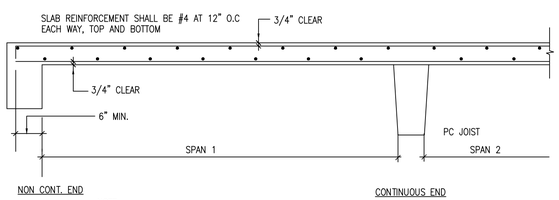


(WINDOW & DOOR OPENINGS 7'–0" WIDE AND LARGER)
1" X P.T. BUCK W/ 1/4"ø X 1 1/2" CONC. EMBEDMENT TAPCON W/ 1"ø WASHER AT 8"o.c., START 3" FROM CORNERS.

(WINDOW & DOOR OPENINGS 6'–6" WIDE AND SMALLER)
1" X P.T. BUCK W/ 1/4"ø X 1 1/2" CONC. EMBEDMENT TAPCON W/ 1"ø WASHER AT 12"o.c., START 3" FROM CORNERS.

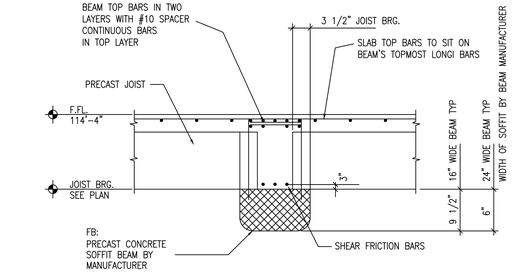
BUCKS TO BE FASTENED HORIZONTALLY AND VERTICALLY TO CONCRETE BEAMS AND COLUMNS OR CONCRETE FILLED MASONRY.
G.C. TO COORDINATE OPENING DIMENSIONS AND BUCK FASTENING DETAIL WITH PRODUCT APPROVALS.

6 MINIMUM WINDOW/ DOOR BUCK FASTENERS TO CMU OR RC MEMBERS
NTS

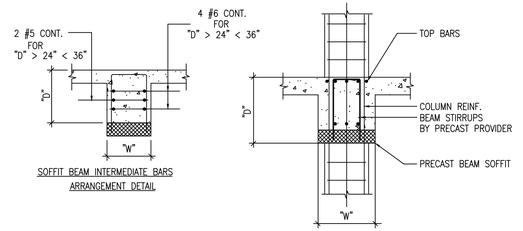


NOTE:
SEE PLANS FOR SLAB DEPTH AND SLAB SUPPORT SPACING.

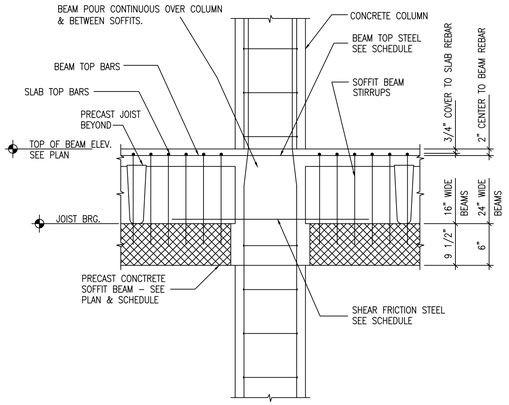
7 FLOOR SLAB REINFORCEMENT LAYOUT
NTS



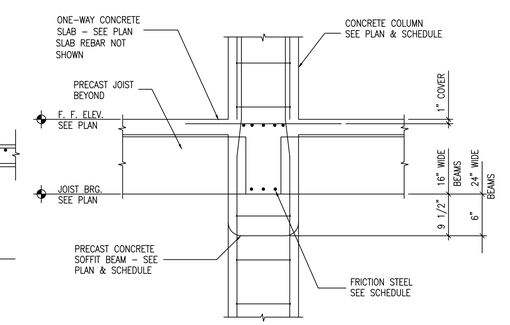
1 TYPICAL SOFFIT BEAM SECTION
NTS



2 SOFFIT BEAM DETAILS
NTS



3 SOFFIT BEAM TO COLUMN DETAIL
NTS



4 SOFFIT BEAM TO COLUMN DETAIL
NTS

Song + Associates
Architecture● Planning ●Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR SECTIONS AND DETAILS

Sheet # :
S22

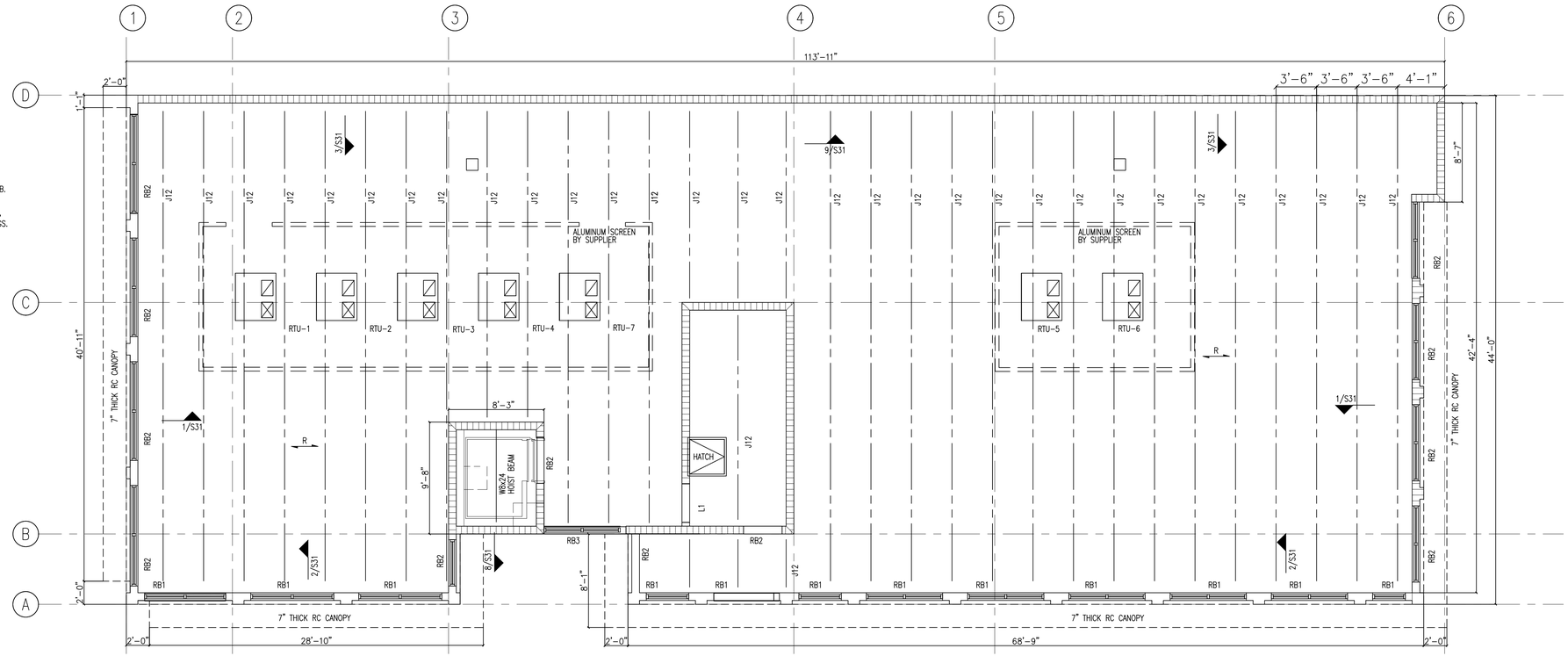
PLAN NOTES:

1. CONCRETE JOISTS BY JOIST MANUFACTURER PER PCI SPECS. PRE-ENGINEERED PRESTRESSED JOISTS TO BEAR ON BEARING PADS AND SPACED PER THE P.C. JOIST MANUFACTURER.
2. ROOF JOIST SHALL BE 12" DEEP PRESTRESSED, PRECAST CONCRETE JOISTS (J12) AT 3'-6" O.C. MAXIMUM UNO.
3. ROOF JOISTS SHALL BE PRESTRESSED, PRECAST CONCRETE JOISTS AS SHOWN.
4. ROOF SLAB: 3" N.W CAST IN PLACE R.C. SLAB WITH #3 AT 12" O.C. EA WAY AT THE CENTER OF THE SLAB.
5. WALLS SHOWN ARE BEARING WALLS AND NON-LOADBEARING WALLS UNDER THE LEVEL SHOWN. FOR WALLS ABOVE THIS LEVEL, SEE STRUCTURAL LEVEL ABOVE AND THE ARCHITECTURAL DRAWINGS.
6. SEE GENERAL STRUCTURAL NOTES ON S01.

TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

LEGEND

RO	INDICATES FRAME REQUIRED FOR ROOF PENETRATION
RB	ROOF BEAM BOTTOM OF ROOF BEAM EL 22'-0" SOFFIT BEAM DESIGN BY SUPPLIER
R	INDICATES DIRECTION OF ROOF SPAN
J12	12" PRECAST JOIST, BY SUPPLIER
L1	CASTCRETE 8F8, 1B PRECAST LINTEL



ROOF FRAMING PLAN
SCALE 3/16" = 1'-0"

TOP OF ROOF SLAB ELEVATION 24'-0"
BOTTOM OF CANOPY SLAB ELEVATION 22'-0"
TOP OF PARAPET ELEVATION 28'-0" MAXIMUM, SEE ARCH ELEVATIONS

CAST IN PLACE CONCRETE BEAM SCHEDULE

MARK	SIZE BxD	TOP REBAR	BOTTOM REBAR	#3 STIRRUP SPACING, INCH	COMMENT	ULTIMATE MOMENT Kip-FT	ULTIMATE SHEAR Kips
RB1	24"x24"				SOFFIT BEAM	47	21
RB2	8"x24"	2#6	2#6	10			
RB3	8"x24"	3#6	3#6	10			

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

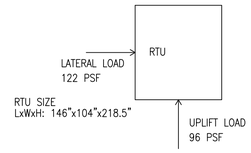
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
ROOF FRAMING PLAN

Sheet # :
S30



A ULTIMATE WIND LOADS ON ROOF TOP UNITS

DESIGN LOADING PER FLORIDA BUILDING CODE 2020

WIND LOAD PER ASCE 7 16:

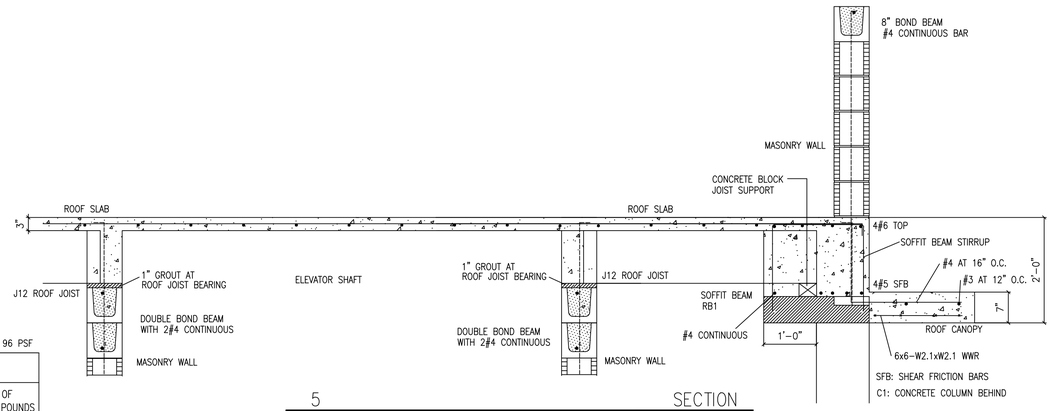
BASIC ULTIMATE WIND SPEED = 170 MPH (132 MPH ASD)
RISK CATEGORY II WIND EXPOSURE CATEGORY "C"
INTERNAL PRESSURE COEFFICIENT = 0
MEAN UNIT HEIGHT = 27 FT
WIND DIRECTIONALITY FACTOR Kd = 0.85 Kz = 0.96
BASIC ULTIMATE WIND PRESSURE = 64 PSF

FOR ROOF TOP UNITS,
LATERAL FORCE COEFFICIENT = 1.9 WL = 122 PSF UPLIFT COEFFICIENT = 1.5 WL = 96 PSF

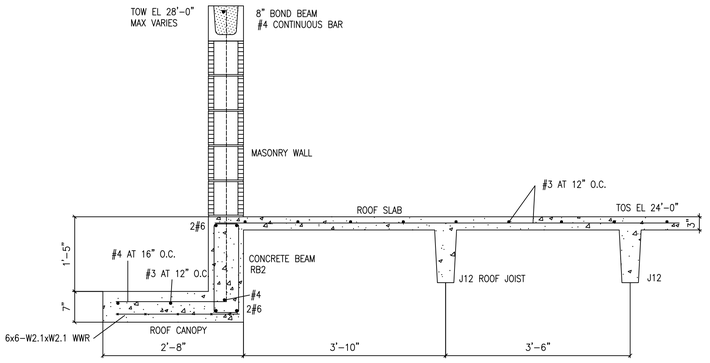
TABLE 1: ULTIMATE WIND LOADS ON UNITS PER ASCE 7 16

UNIT	LATERAL LOADS		UPLIFT ON UNIT, POUNDS	WEIGHT OF UNIT, POUNDS	WEIGHT OF STAND, POUNDS
	ON LENGTH, POUNDS	ON WIDTH, POUNDS			
RTU-1	2068	1773	1371	380	50*
RTU-2	2068	1773	1371	380	50*
RTU-3	2068	1773	1371	380	50*
RTU-4	2068	1773	1371	380	50*
RTU-5	2490	1899	1769	460	50*
RTU-6	2490	1899	1769	460	50*
RTU-7	2490	1899	1769	460	50*

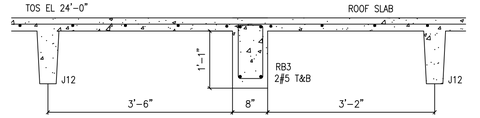
* ASSUMED. FIELD VERIFY. ASD WIND PRESSURE = 0.6x ULTIMATE WIND PRESSURE



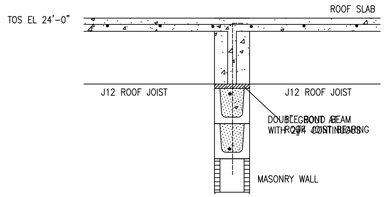
5 SECTION 3/4"=1'-0"



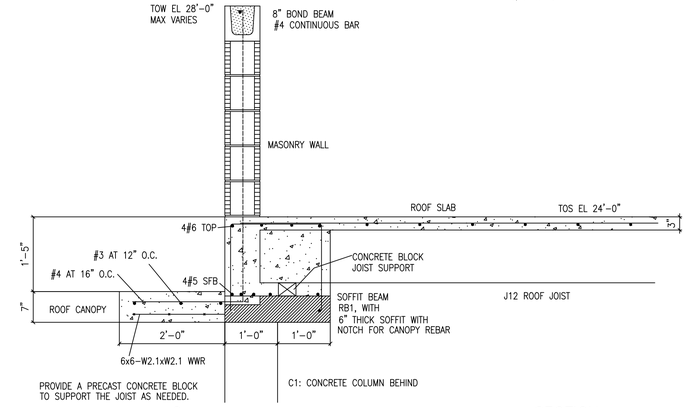
1 SECTION 3/4"=1'-0"



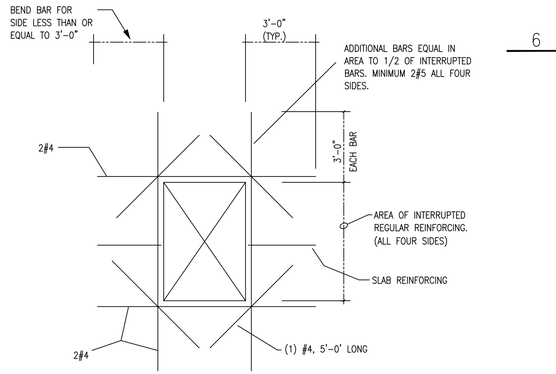
9 SECTION 3/4"=1'-0"



6 SECTION 3/4"=1'-0"



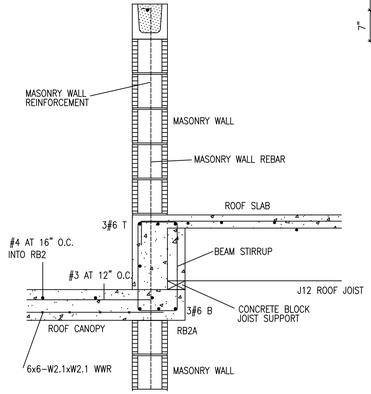
2 SECTION 3/4"=1'-0"



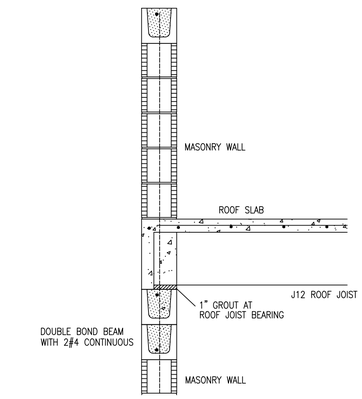
REINFORCING AT OPENING

1. OMIT ADDED BARS AT OPENINGS OF 10" OR LESS AND RUN NORMAL REINFORCING BY SIDE OF OPENING.
2. OPENINGS SHALL BE SHOWN ON THE REINFORCING STEEL SHOP DRAWINGS.

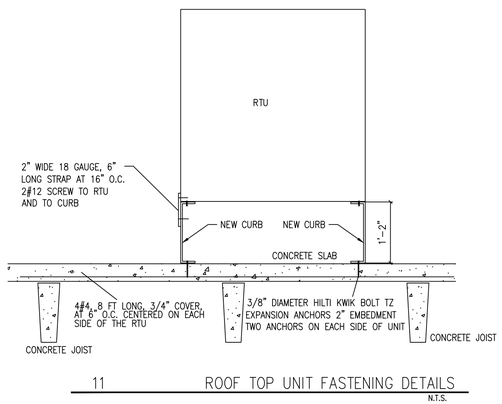
10 SLAB OPENING DETAIL NTS



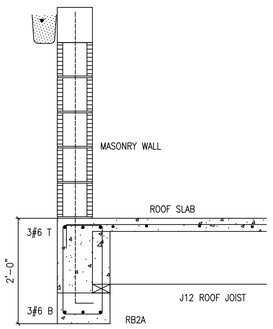
7 SECTION 3/4"=1'-0"



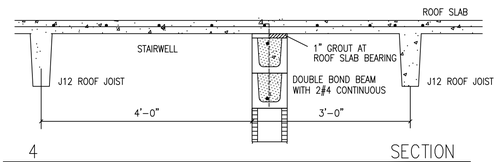
3 SECTION 3/4"=1'-0"



11 ROOF TOP UNIT FASTENING DETAILS N.T.S.



8 SECTION 3/4"=1'-0"



4 SECTION 3/4"=1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

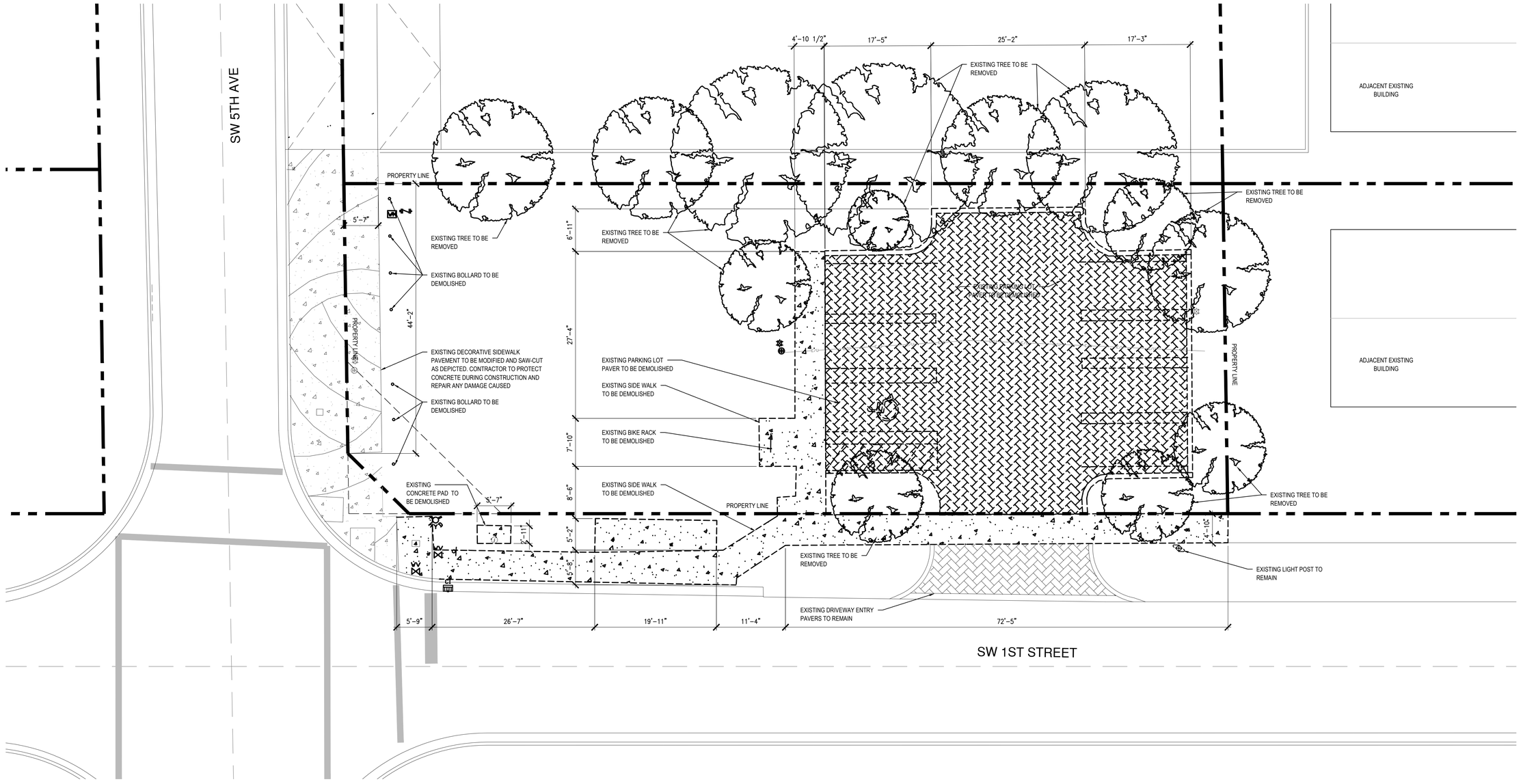
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
ROOF SECTIONS AND DETAILS

Sheet # :

S31



SITE DEMOLITION PLAN

01

1/8" = 1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

STATE OF FLORIDA
ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

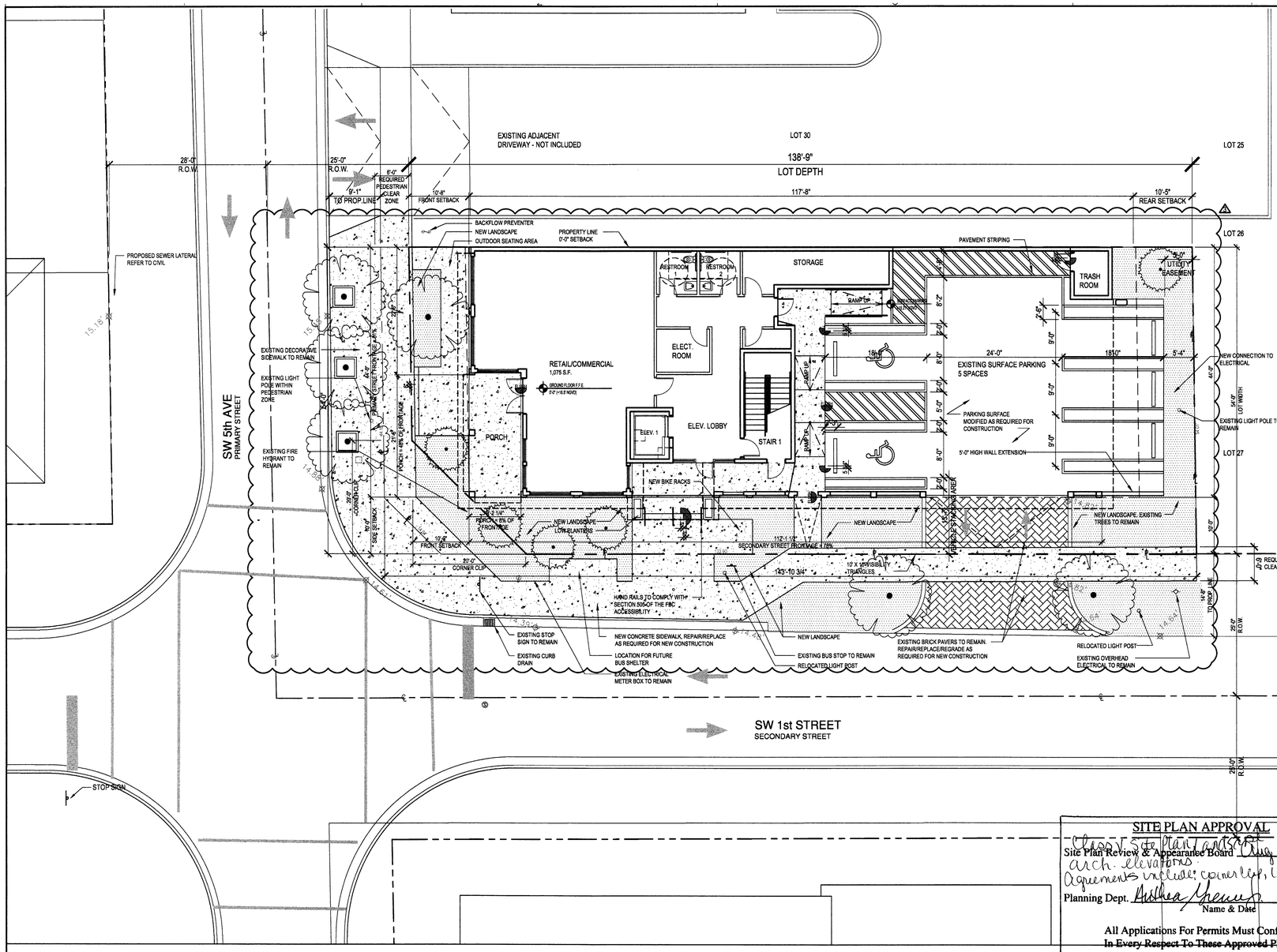
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

SITE DEMO PLAN

Sheet # :

AD-100



LEGEND:

- RIGHT OF WAY/PROPERTY LINE
- SETBACK LINE
- PROPOSED BUILDING
- PROPOSED HAND RAIL
- PROPOSED CONCRETE SIDEWALK/SURFACE. SEE CIVIL DRAWINGS FOR DETAILS.
- PROPOSED ASPHALT RESTORATION. SEE CIVIL DRAWINGS FOR DETAILS.
- PROPOSED CONCRETE SIDEWALK/SURFACE RESTORATION. SEE CIVIL DRAWINGS FOR DETAILS.
- PROPOSED RELOCATED PAVERS. SEE CIVIL DRAWINGS FOR DETAILS.
- NEW LANDSCAPED AREAS. SEE LANDSCAPE DRAWINGS FOR DETAILS.
- R.O.W. DEDICATION REQUIRED BY THE CITY OF DELRAY BEACH

PROJECT DATA MATRIX						
Site data provided pursuant to LDR Section 4.3.4(K) - Development Standards Matrix						
SCOPE OF WORK						
A. NEW CONSTRUCTION OF A 2 STORY BUILDING						
1. PRIMARY OCCUPANCY: B-BUSINESS						
2. SECONDARY OCCUPANCY: C-COMMERCIAL						
B. CONSTRUCTION TYPE: II						
C. UNSPRINKLERED						
LEGAL DESCRIPTION						
Lots 28 and 29, Block 29, RE-SUBDIVISION OF BLOCKS 29 AND 37, DELRAY, according to the Plat thereof, recorded in Plat Book 9, Page 66, of the Public Records of Palm Beach County, Florida.						
PROPERTY INFORMATION						
Address: 95 SW 5th Avenue, Delray Beach, FL 33444						
Property Control Number (PCN): 12-43-46-17-06-029-0280						
Zoning District: Central Business District (CBD) - West Atlantic Neighborhood Sub-district						
Future Land Use: Commercial Core (CC)						
F.E.M.A. FLOOD PLAIN DESIGNATION						
Flood Zone : X	Description: Zone X represents areas outside the 500-year flood					
Finished Floor Elevation: +16.5' N.A.V.D.	plain with less than 0.2% annual probability of flooding.					
***LOT SIZE**	**Required / Permitted**		**Existing**		**Proposed**	
Total Lot Area	2,000 SF Min.		7,713 SF		7,292 SF	
Width of Site	20'-0"		54'-0"		54'-0"	
Depth of Site	N/A		143'-9"		138'-9"	
BUILDING CONFIGURATION	**Required / Permitted**		**Existing**		**Proposed**	
Front Setback	10'-0"	15'-0"	N/A		10'-0"	
Side Interior Setback	0'-0"	5'-0"	N/A		0'-0"	
Side Street Setback	10'-0"	15'-0"	N/A		10'-0"	
Rear Setback	10'-0"	10'-0"	N/A		10'-0"	
BUILDING HEIGHT	**Required / Permitted**		**Existing**		**Proposed**	
Minimum Height on Primary Street	1 Story and 18'-0"		N/A		2 Story and 24'-0"	
Ouside of Atlantic Ave Limited Height Area	4 stories and 54'-0"		N/A		2 Story and 24'-0"	
Ground Story Height	12'-0" Min.		N/A		12'-0"	
FRONTAGE	**Required / Permitted**		**Existing**		**Proposed**	
Primary Street	**Min.**	**Max.**	**LF**	**%**	**LF**	**%**
SW 5th Avenue	75%	100%	N/A	N/A	44'-0"	81%
Secondary Street						
SW 1st Street	75%	100%	N/A	N/A	121'-8"	84%
Frontage type						
Porch						
AREA CALCULATIONS	**Required / Permitted**		**Existing**		**Proposed**	
Area	**Min.**	**Max**	**SF**	**%**	**SF**	**%**
Pervious Area			4,616 SF	63%	1,209 SF	17%
Impervious Area			3,097 SF	42%	6,083 SF	83%
**Open Space			N/A	N/A	N/A	N/A
Building Area						
Ground Floor Area			0	0	2,245 SF	31%
Second Floor Area			0	0	4,844 SF	66%
Total Floor Area	0	21,877 SF	0	0	**7,089 SF**	
Floor Area Ratio (FAR)	3		0		0.97	
Footnotes:						
** Lot size reduced to accommodate Required Dedication for R.O.W.*						
*** Sites smaller than 20,000 SF do not have Open Space Requirements*						
PARKING CALCULATIONS	**Required / Permitted**		**Existing**		**Proposed**	
Regular Vehicular	N/A		6		3	
ADA Vehicular	N/A		1		2	
Total			**7**		**5**	
Bicycle Parking	1 / 2,000 SF		0		6	

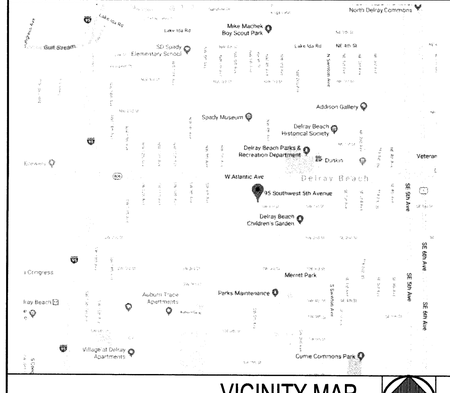
SITE PLAN APPROVAL

Site Plan Review & Appearance Board Chair V. Site Plan Transmittal Date 25, 2021
arch. elevations
Agreements include: corner clip, Cma, CEU, Pedestrian Clear Zone, ROW
Planning Dept. Anthea Gremillet 12/8/21
Name & Date

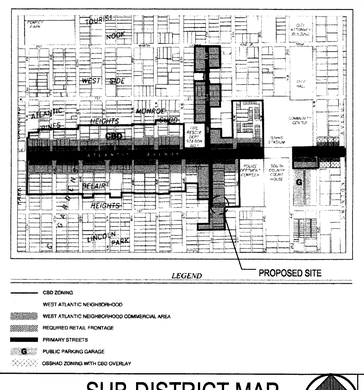
All Applications For Permits Must Conform
In Every Respect To These Approved Plans.

In-Lieu Parking ☒ N/A ☐ Yes
No. of Spaces _____ Amount Due $_____

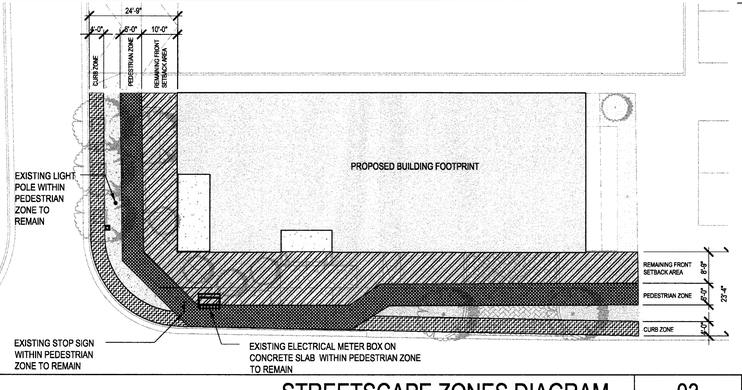
SITE PLAN 01 1"= 10'-0"



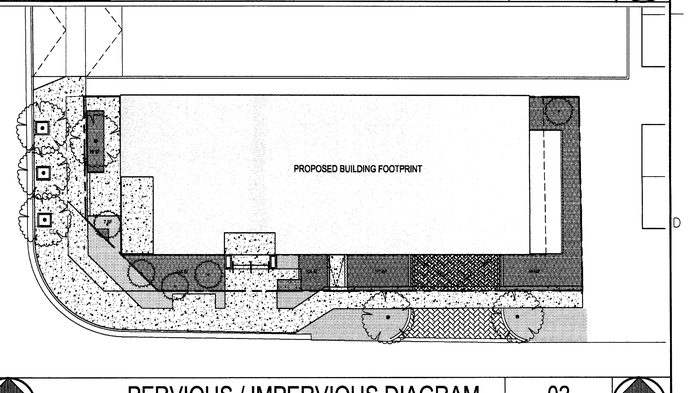
VICINITY MAP



SUB-DISTRICT MAP



STREETSCAPE ZONES DIAGRAM 03 1"= 20'-0"



PERVIOUS / IMPERVIOUS DIAGRAM 02 1"= 20'-0"

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095
Seal :
STATE OF FLORIDA JORGE R. LUACES 57 AR-93912 REGISTERED ARCHITECT
Name : JORGE R. LUACES
License # : AR93912
Consultants :

COPYRIGHT © 2011 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc., whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
COMMUNITY REDEVELOPMENT AGENCY

DELRAY BEACH CRA DEVELOPMENT

95 SW 5TH AVE., DELRAY BEACH, FL 33483

Key Plan :

BLDG DEPT. COMMENTS - REV #1 - 06/2020
BLDG DEPT. COMMENTS - REV #3 -08/02/2021

Date : 11-29-2021
S+A Project No : 18069
Owner Project No :
Drawn By : EP
Checked By : JL
Phase :

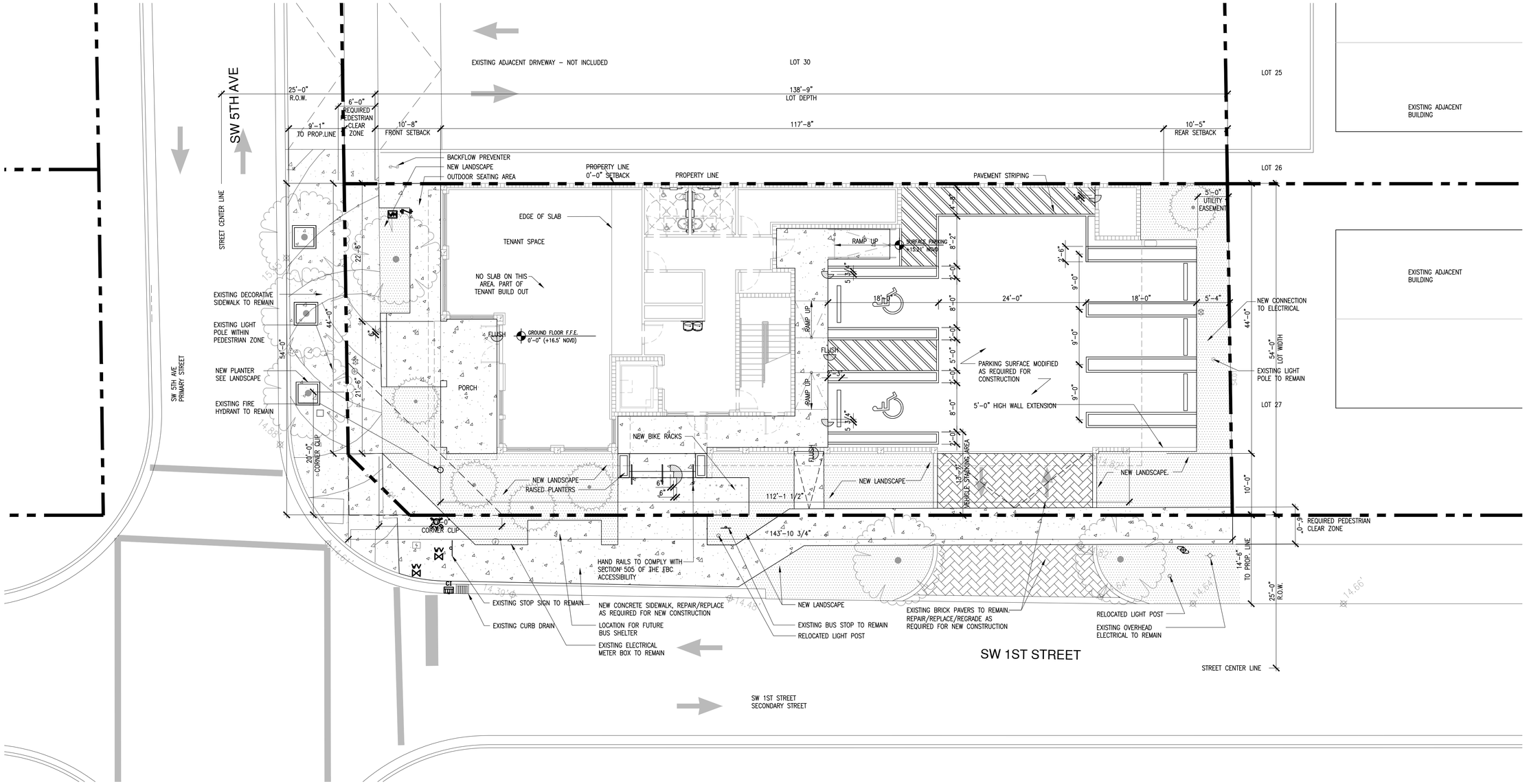
SITE PLAN APPROVAL

Sheet Title :

SITE PLAN

Sheet # :

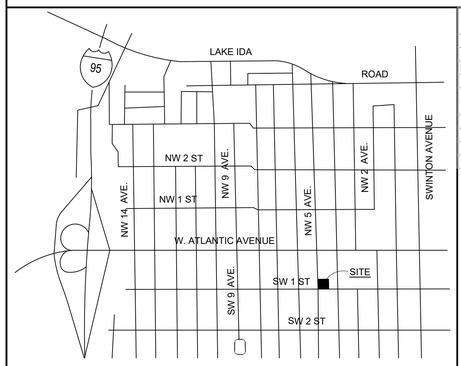
AS1.0



SITE PLAN

01

1/8" = 1'-0"



VISINITY MAP

02

NTS

AREA CALCULATIONS	REQUIRED / PERMITTED		EXISTING		PROPOSED	
	MIN.	MAX.	SF	%	SF	%
AREA						
PERVIOUS AREA			4,616 SF	63%	1,209 SF	17%
IMPERVIOUS AREA			3,097 SF	42%	6,083 SF	83%
**OPEN SPACE			N/A	N/A	N/A	N/A
BUILDING AREA						
GROUND FLOOR AREA			0	0	2,245 SF	31%
SECOND FLOOR AREA			0	0	4,844 SF	66%
TOTAL FLOOR AREA	0	21,877 SF	0	0	7,089 SF	
FLOOR AREA RATIO (FAR)	3		0		0.97	

*LOT SIZE	REQUIRED / PERMITTED		EXISTING		PROPOSED	
TOTAL LOT AREA	2,000 SF MIN.		7,713 SF		7,292 SF	
WIDTH OF SITE	20'-0"		54'-0"		54'-0"	
DEPTH OF SITE	N/A		143'-9"		138'-9"	
BUILDING CONFIGURATION	REQUIRED / PERMITTED		EXISTING		PROPOSED	
FRONT SETBACK	10'-0"	15'-0"	N/A		10'-0"	
SIDE INTERIOR SETBACK	0'-0"	5'-0"	N/A		0'-0"	
SIDE STREET SETBACK	10'-0"	15'-0"	N/A		10'-0"	
REAR SETBACK	10'-0"	10'-0"	N/A		10'-0"	
BUILDING HEIGHT	REQUIRED / PERMITTED		EXISTING		PROPOSED	
MINIMUM HEIGHT ON PRIMARY STREET	1 STORY AND 18'-0"		N/A		2 STORY AND 24'-0"	
OUSIDE OF ALTANTIC AVE LIMITED HEIGHT AREA	4 STORIES AND 54'-0"		N/A		2 STORY AND 24'-0"	
GROUND STORY HEIGHT	12'-0" MIN.		N/A		12'-0"	
FRONTAGE	REQUIRED / PERMITTED		EXISTING		PROPOSED	
PRIMARY STREET	MIN.	MAX.	LF	%	LF	%
SW 5TH AVENUE	75%	100%	N/A	N/A	44'-0"	81%
SECONDARY STREET						
SW 1ST STREET	75%	100%	N/A	N/A	121'-8"	84%
FRONTAGE TYPE						
PORCH						

PROJECT DATA MATRIX			
SITE DATA PROVIDED PURSUANT TO LDR SECTION 4.3.4(K) – DEVELOPMENT STANDARDS MATRIX			
LEGAL DESCRIPTION			
LOTS 28 AND 29, BLOCK 29, RE-SUBDIVISION OF BLOCKS 29 AND 37, DELRAY, ACCORDING TO THE PLAT THEREOF, RECORDED IN PLAT BOOK 9, PAGE 66, OF THE PUBLIC RECORDS OF PALM BEACH COUNTY, FLORIDA.			
PROPERTY INFORMATION			
ADDRESS:	95 SW 5TH AVENUE, DELRAY BEACH, FL 33444		
PROPERTY CONTROL NUMBER (PCN):	12-43-46-17-06-029-0280		
ZONING DISTRICT:	CENTRAL BUSINESS DISTRICT (CBD) – WEST ATLANTIC NEIGHBORHOOD SUB-DISTRICT		
FUTURE LAND USE:	COMMERCIAL CORE (CC)		
F.E.M.A. FLOOD PLAIN DESIGNATION	ZONE X = REPRESENTS AREAS OUTSIDE THE 500-YEAR FLOOD PLAIN WITH LESS THAN 0.2% ANNUAL PROBABILITY OF FLOODING.		
FINISHED FLOOR ELEVATION:	+16.5' N.A.V.D.		
FOOTNOTES:			
* LOT SIZE REDUCED TO ACCOMMODATE REQUIRED DEDICATION FOR R.O.W.			
** SITES SMALLER THAN 20,000 SF DO NOT HAVE OPEN SPACE REQUIREMENTS			
PARKING CALCULATIONS	REQUIRED / PERMITTED	EXISTING	PROPOSED
REGULAR VEHICULAR	N/A	6	3
ADA VEHICULAR	N/A	1	2
TOTAL		7	5
BICYCLE PARKING	1 / 2,000 SF	0	6

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022
CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

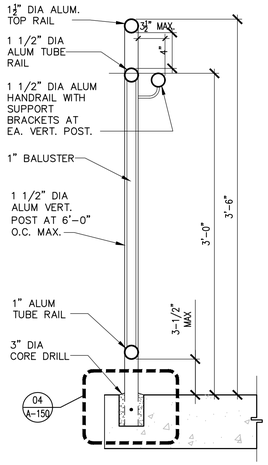
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

SITE PLAN

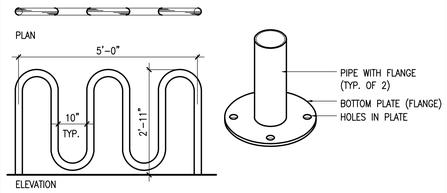
Sheet # :

A-100



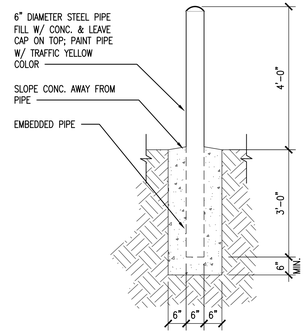
EXTERIOR HANDRAIL DETAIL — 01

– – 1-1/2" = 1'-0"



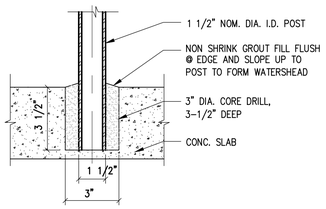
BICYCLE RACK ELEVATION — 02

– – 1/2" = 1'-0"



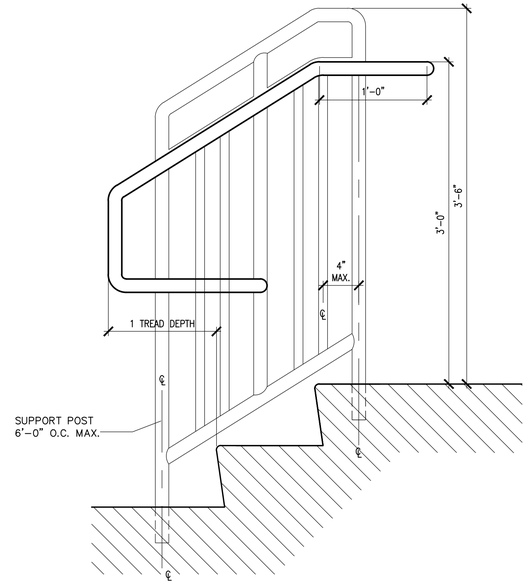
BOLLARD DETAIL — 03

– – 1/2" = 1'-0"



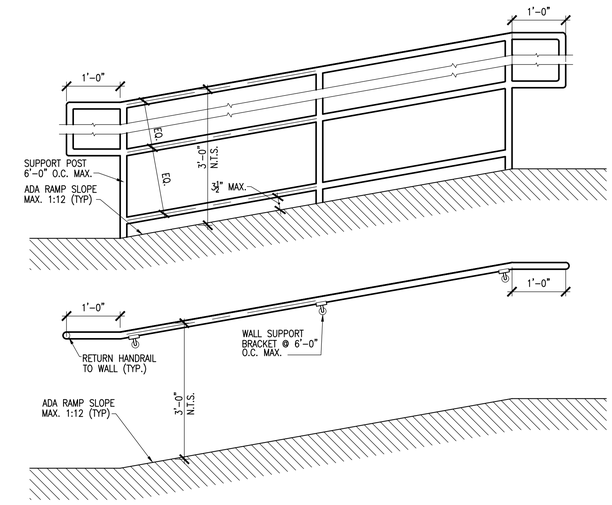
HANDRAIL BASE DETAIL — 04

– – 3" = 1'-0"



FRONT ENTRY RAILING ELEVATION — 05

– – 1-1/2" = 1'-0"



TYPICAL ADA RAMP DETAIL SECTION — 06

– – 3/4" = 1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

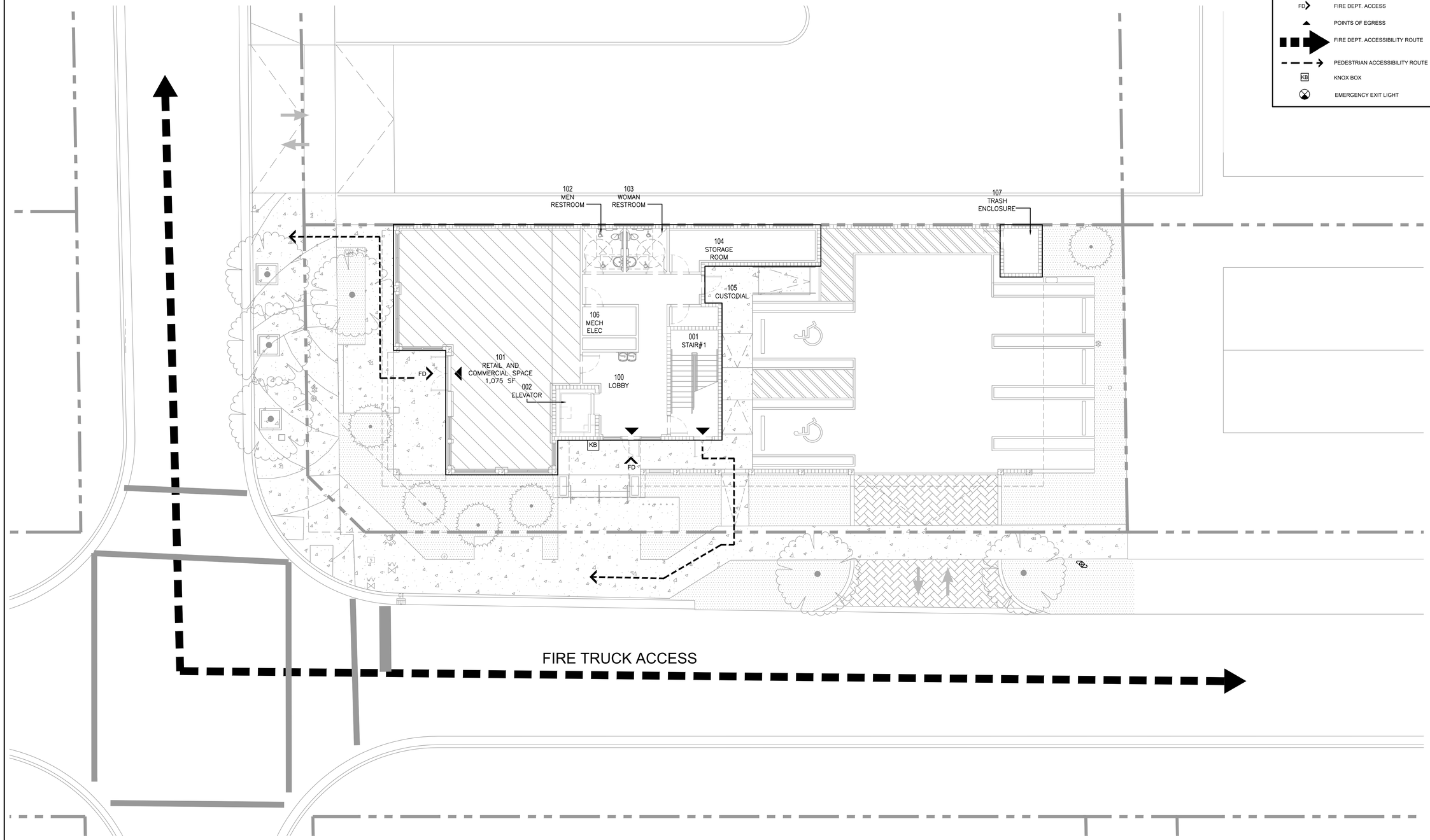
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

SITE PLAN DETAILS

Sheet # :

A-150



LIFE SAFETY SITE PLAN | 01 | 1/8" = 1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

LIFE SAFETY SITE PLAN

Sheet # :

LS-100

REQUIRED MIN. PLUMBING FIXTURES

FBC PLUMBING TABLE 403.1 FOR OCCUPIED SPACES

OCCUPANCY AND SQUARE FOOTAGE	TOTAL OCCUPANT LOAD	WATER CLOSET						URINAL		LAVATORY						DRINKING FOUNTAIN				SERVICE SINK	
		REQUIRED	# REQ.		# PROV.			# PROV.	REQUIRED	# REQ.		# PROV.			REQ.	# REQ.	# PROV.		REQ.	# PROV.	
			F	M	F	M	UNI	M		F	M	F	M	UNI							
FIRST FLOOR																					
MERCANTILE 1,075 SF	8	1 PER 25 FOR THE FIRST 50 AND 1 PER 50 FOR THE REMAINDER EXCEEDING 50	1	1	1	1	0	0	1 PER 40 FOR THE FIRST 80 AND 1 PER 80 FOR THE REMAINDER EXCEEDING 80	1	1	1	1		1 PER 100	1	1		1	1
			2		2			0		2		2									
TOTAL			2		2					2		2									
SECOND FLOOR																					
BUSINESS 3,732 SF	26	1 PER 25 FOR THE FIRST 50 AND 1 PER 50 FOR THE REMAINDER EXCEEDING 50	1	1	1	1	0	0	1 PER 40 FOR THE FIRST 80 AND 1 PER 80 FOR THE REMAINDER EXCEEDING 80	1	1	1	1		1 PER 100	1	1		1	1
			2		2			0		2		2									
TOTAL			2		2					2		2									

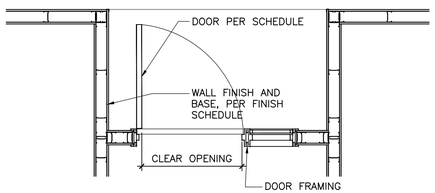
EGRESS WIDTH TABULATIONS

FBC TABLE1005.3.1 & 1005.3.2. NFPA TABLE 7.3.3.1 & 7.3.3.2

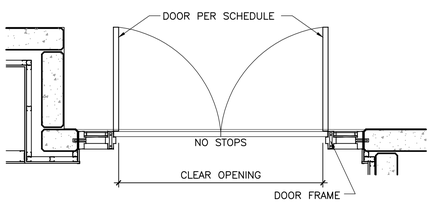
EGRESS WIDTH PER OCCUPANT .2" HORIZONTAL CIRCULATION (MIN. 44") / .3" VERTICAL CIRCULATION (MIN. 44")

	AREA	CALCULATED NO. OF OCCUPANTS	CORRIDORS			STAIRS		
			EXIT WIDTH INCHES REQ'D	EXIT WIDTH INCHES PROV.	EXIT WIDTH OCC PROV.	EXIT WIDTH INCHES REQ'D	EXIT WIDTH INCHES PROV.	EXIT WIDTH OCC PROV.
FIRST FLOOR BUSINESS @ 150 SF/OCC	1,075 SF	8 OCC.	44"	198"	990 OCC	N/A	N/A	N/A
SECOND FLOOR BUSINESS @ 150 SF/OCC	3,732 SF	26 OCC.	44"	66"	330 OCC	44"	60"	300 OCC

AREA CALCULATIONS	REQUIRED / PERMITTED		EXISTING		PROPOSED	
	MIN.	MAX.	SF	%	SF	%
AREA						
PERVIOUS AREA			4,616 SF	63%	1,209 SF	17%
IMPERVIOUS AREA			3,097 SF	42%	6,083 SF	83%
**OPEN SPACE			N/A	N/A	N/A	N/A
BUILDING AREA						
GROUND FLOOR AREA			0	0	2,245 SF	31%
SECOND FLOOR AREA			0	0	4,844 SF	66%
TOTAL FLOOR AREA	0	21,877 SF	0	0	7,089 SF	
FLOOR AREA RATIO (FAR)	3		0		0.97	



DOOR OPENING CLEAR WIDTH
36" WIDE DOOR = 33"



DOOR OPENING CLEAR WIDTH
(2) 36" WIDE DOORS =66"
(2) 42" WIDE DOORS =84"
(2) 48" WIDE DOORS =92"

WIDTHS ARE CALCULATED PER FBC 1010.1.1 and NFPA 101 sect. 7.2.1.2.1.1.5 & 7.2.1.2.1.1.6

CODE REQUIREMENTS

CATEGORY	FBC	REQUIREMENTS	PROVIDED
CONSTRUCTION TYPE	TABLE 601	TYPE V B BEARING WALLS 0 HR STRUCTURAL FRAME 0 HR FLOOR CONSTRUCTION 0 HR ROOF CONSTRUCTION 0 HR	TYPE V B BEARING WALLS 0 HR STRUCTURAL FRAME 0 HR FLOOR CONSTRUCTION 0 HR ROOF CONSTRUCTION 0 HR
AREA/STORY/HEIGHT ALLOWABLE	TABLE 506.2 & 504.4 (BUSINESS)	9,000 SF/ 2 STORY/ 40' * UNSPRINKLERED	7,089 SF/ 2 STORY/ 32' * UNSPRINKLERED
DEAD END (BUSINESS)	1020.4 EXCEPTION 2	50'	N/A
EXIT ACCESS TRAVEL DISTANCE (BUSINESS)	TABLE 1017.2	100' * UNSPRINKLERED	71'-7" * UNSPRINKLERED
COMMON PATH (BUSINESS)	1006.2.1 EXCEPTION A	75'	N/A
OCCUPANT LOADS	TABLE 1004.1.2	BUSINESS: 150 GSF/ OCC.	BUSINESS: 150 GSF/ OCC.

BUILDING AREA	TOTAL:	7,089 GSF
LIFE SAFETY SF:	TOTAL:	4,807 SF
OCCUPANCY TYPE	BUSINESS / GROUP B (FBC 304 & 1004/NFPA 101-6.1.11/7.3.1.2)	
TOTAL OCCUPANT LOAD	FIRST FLOOR BUSINESS: = 8 OCC. SECOND FLOOR ASSEMBLY: = 26 OCC. TOTAL: = 34 OCC.	
MAX FLOOR AREA PER OCCUPANT BUSINESS	~~150SF / OCC~~	
CONSTRUCTION TYPE	TYPE V B	
AUTOMATIC FIRE SPRINKLER SYSTEM	UNSPRINKLERED	

	REQUIRED	PROVIDED
MAX. EXIT ACCESS TRAVEL DISTANCE	LESS THAN 300'	165'
MAX. COMMON PATH OF TRAVEL	LESS THAN100'	18'
MIN. CLEAR OPENING OF EXIT DOOR	32"	33"
MIN. CORRIDOR WIDTH	44"	60"
MAX DEAD END	LESS THAN 50'	18'

APPLICABLE CODES

TO THE BEST OF MY KNOWLEDGE, THESE DRAWINGS AND THE PROJECT MANUAL ARE COMPLETE AND COMPLY WITH THE "FLORIDA BUILDING CODE", THE "FLORIDA FIRE PREVENTION CODE", AND OTHER APPLICABLE CODES AND REGULATIONS.

THE DESIGN AND CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS. SHOULD THERE BE A CONFLICT BETWEEN ANY CODE REQUIREMENTS, COMPLY WITH THE REQUIREMENT THAT PROVIDES THE GREATEST DEGREE OF LIFE SAFETY.

A. FBC (FLORIDA BUILDING CODE), 7th EDITION 2020.
   1. FBC – BUILDING
   2. FBC – ACCESSIBILITY
   3. FBC – ENERGY CONSERVATION
   4. FBC – MECHANICAL
   5. FBC – FUEL GAS
   6. FBC – PLUMBING
B. FLORIDA FIRE PREVENTION CODE, 6th EDITION 2017 INCLUDING:
C. NFPA 101–2018 EDITION LIFE SAFETY CODE
D. NEC (NATIONAL ELECTRICAL CODE) 2020

GENERAL NOTES

1. SEAL ALL OPENINGS AND PENETRATIONS TO RESIST THE MIGRATION OR PASSAGE OF SMOKE AND GASES.
2. SPECIFIC EXCEPTIONS TO THE LISTED RATINGS MAY BE PERMITTED WHERE INDICATED.
3. FIRE RESISTANT ASSEMBLIES, MATERIALS, PROPERTIES AND THICKNESS REQUIRED, SHALL COMPLY WITH THOSE WHICH HAVE SUCCESSFULLY BEEN PERFORMED UNDER TESTS MADE BY A RECOGNIZED LABORATORY PER ASTM E119 OR BASED ON CALCULATIONS PERMITTED BY THE FBC AND BUILDING OFFICIAL.
4. SEE REFLECTED CEILING PLANS FOR REMAINDER OF LIGHTING.

PROJECT SUMMARY

A. CONSTRUCTION CONSISTS OF:

B. ONE 2 STORY OPEN TENANT SPACE BUILDING
C. 1 BUSINESS TENANT SPACE IN THE FIRST FLOOR
D. 2 BUSINESS TENANT SPACE IN THE SECOND FLOOR
E. FIRST FLOOR PARKING GARAGE
F. COMMUNAL SUPPORT SPACES FOR ALL TENANT AREAS

Song + Associates

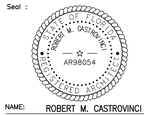
Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :



NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022
CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

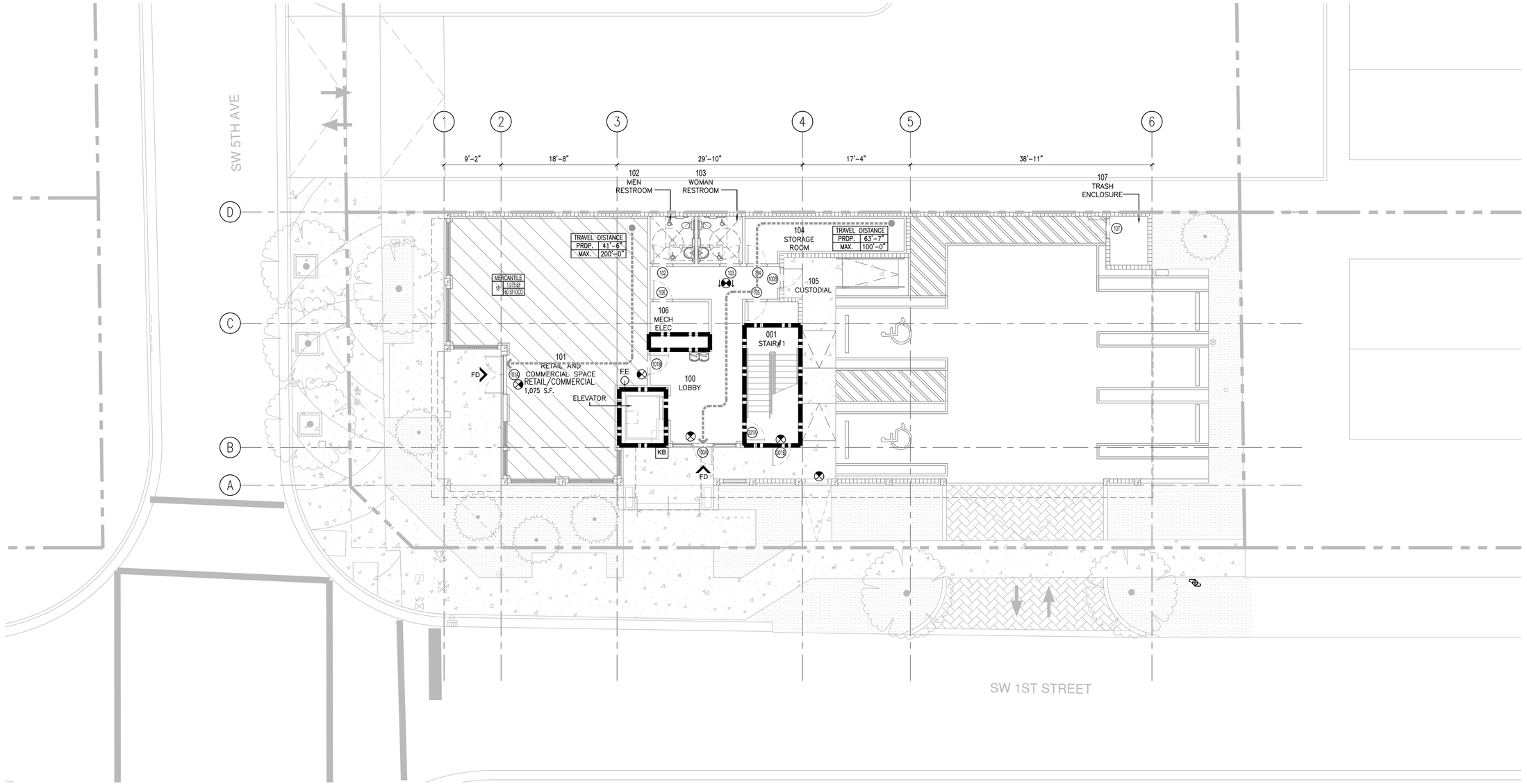
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

LIFE SAFETY SUMMARY

Sheet # :

LS-200



LIFE SAFETY FIRST FLOOR PLAN

01

1/8" = 0'-0"

LIFE SAFETY LEGEND

EGRESS

REQ'D — REQUIRED EGRESS CAPACITY OF DOORS & EXITS (# OF OCCUPANTS)

PROV — PROVIDED EGRESS CAPACITY OF DOORS & EXITS (# OF OCCUPANTS)

TD — TRAVEL DISTANCE: DISTANCE IN FEET FROM AN OCCUPIABLE POINT 12" FROM WALL TO THE NEAREST EXIT

LIGHTED EXIT SIGN – SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

LIGHTED EXIT SIGN – DOUBLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

LIGHTED DIRECTIONAL EXIT SIGN – SINGLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

LIGHTED DIRECTIONAL EXIT SIGN – DOUBLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

LIGHTED WALL MOUNTED EXIT SIGN – SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

FIRE EXTINGUISHERS

FEC — FIRE EXTINGUISHER CABINET WITH UL RATED 3-A:40-B:C 5# EXTINGUISHER UNLESS OTHERWISE INDICATED OR SPECIFIED AS A, B, B:C, D OR K. ONE PER EVERY 3,000/SF

FACP — FIRE ALARM CONTROL PANEL

FAAP — FIRE ALARM ANNUNCIATOR PANEL

GMP — GENERATOR MONITORING PANEL

FE — FIRE EXTINGUISHER ON WALL-MOUNTED BRACKET UL RATED 3-A:40-B:C 5# EXTINGUISHER UNLESS OTHERWISE INDICATED OR SPECIFIED AS A, B, B:C, D OR K. ONE PER EVERY 3,000/SF

FD — FIRE DEPARTMENT ACCESS

DOOR HARDWARE RELATED INFORMATION

(xx) DOOR TAG

(P) PANIC HARDWARE

(#) RATED DOORS IN MINUTES

KB — KNOX BOX

EMERGENCY LIGHT

EM — EMERGENCY DUAL HEAD LIGHTING UNIT WITH BATTERY PACK

2'X2' EMERGENCY FIXTURE

2'X4' EMERGENCY FIXTURE

RECESSED EMERGENCY FIXTURE

1'X4' EMERGENCY FIXTURE

PENDANT EMERGENCY FIXTURE

WALL MOUNTED EMERGENCY FIXTURE

WALL MOUNTED STRIP EMERGENCY FIXTURE

GENERAL NOTES:

1. SEAL ALL OPENINGS AND PENETRATIONS TO RESIST THE MIGRATION OR PASSAGE OF SMOKE AND GASES.
2. SPECIFIC EXCEPTIONS TO THE LISTED RATINGS MAY BE PERMITTED WHERE INDICATED.
3. FIRE RESISTANT ASSEMBLIES, MATERIALS, PROPERTIES AND THICKNESS REQUIRED, SHALL COMPLY WITH THOSE WHICH HAVE SUCCESSFULLY BEEN PERFORMED UNDER TESTS MADE BY A RECOGNIZED LABORATORY PER ASTM E119 OR BASED ON CALCULATIONS PERMITTED BY THE FBC AND BUILDING OFFICIAL.
4. SEE REFLECTED CEILING PLANS FOR REMAINDER OF LIGHTING.
5. FOR FIRE ALARM HORN, STROBE, PULL STATION, AND SMOKE DETECTORS REFER TO ELECTRICAL DRAWINGS.

WALLS & PARTITIONS

1 HR FIRE RATED HAZARD SEPARATION ALL DOORS AND OPENINGS SHALL BE PROTECTED BY A 45 MINUTE FIRE-RESISTANT EXCEPT AT STAIRS & SHAFTS. ALL DOORS AND PENETRATIONS INTO STAIRS AND SHAFTS SHALL HAVE A 60-MINUTE FIRE RESISTANCE RATING, ADDITIONAL PENETRATION OF STAIR SHAFTS IS NOT PERMITTED EXCEPT AS SPECIFICALLY EXCEPTED.

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

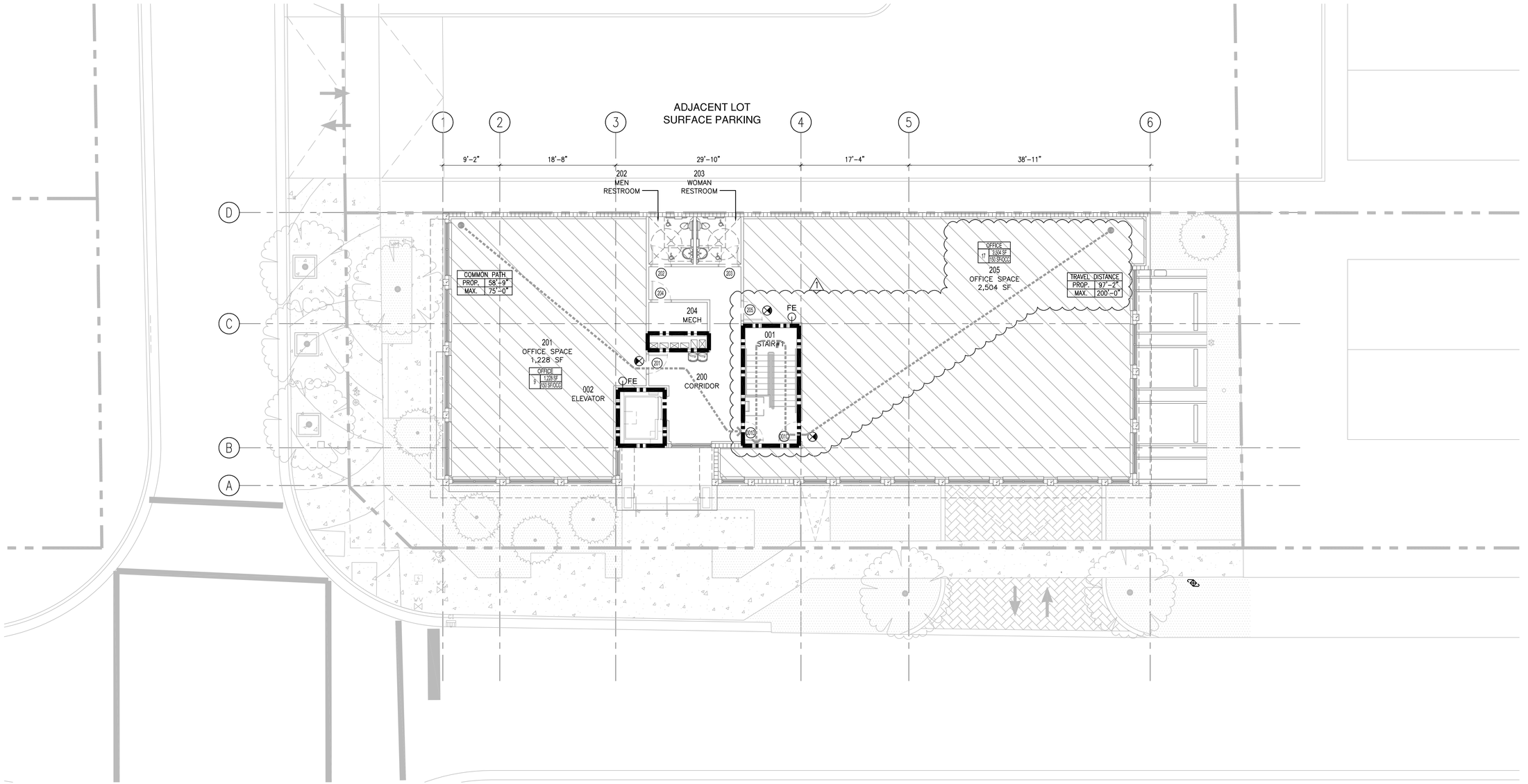
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
LIFE SAFETY FIRST FLOOR PLAN

Sheet # :
LS-201



LIFE SAFETY SECOND FLOOR PLAN

01

1/8" = 0'-0"

LIFE SAFETY LEGEND

EGRESS

REQ'D — REQUIRED EGRESS CAPACITY OF DOORS & EXITS (# OF OCCUPANTS)
PROV'D — PROVIDED EGRESS CAPACITY OF DOORS & EXITS (# OF OCCUPANTS)

TD — TRAVEL DISTANCE
DISTANCE IN FEET FROM AN OCCUPIABLE POINT 12" FROM WALL TO THE NEAREST EXIT

LIGHTED EXIT SIGN – SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

LIGHTED EXIT SIGN – DOUBLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

LIGHTED DIRECTIONAL EXIT SIGN – SINGLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

LIGHTED DIRECTIONAL EXIT SIGN – DOUBLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

LIGHTED WALL MOUNTED EXIT SIGN – SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED

FIRE EXTINGUISHERS

FEC — FIRE EXTINGUISHER CABINET WITH UL RATED 3-A:40-B:C 5# EXTINGUISHER UNLESS OTHERWISE INDICATED OR SPECIFIED AS A, B, B:C, D OR K. ONE PER EVERY 3,000/SF

FACP — FIRE ALARM CONTROL PANEL

FAAP — FIRE ALARM ANNUNCIATOR PANEL

GMP — GENERATOR MONITORING PANEL

FE — FIRE EXTINGUISHER ON WALL-MOUNTED BRACKET UL RATED 3-A:40-B:C 5# EXTINGUISHER UNLESS OTHERWISE INDICATED OR SPECIFIED AS A, B, B:C, D OR K. ONE PER EVERY 3,000/SF

FD — FIRE DEPARTMENT ACCESS

DOOR HARDWARE RELATED INFORMATION

(xx) — DOOR TAG

(P) — PANIC HARDWARE

(#) — RATED DOORS IN MINUTES

KB — KNOX BOX

EMERGENCY LIGHT

EM — EMERGENCY DUAL HEAD LIGHTING UNIT WITH BATTERY PACK

2'X2' EMERGENCY FIXTURE

2'X4' EMERGENCY FIXTURE

RECESSED EMERGENCY FIXTURE

1'X4' EMERGENCY FIXTURE

PENDANT EMERGENCY FIXTURE

WALL MOUNTED EMERGENCY FIXTURE

WALL MOUNTED STRIP EMERGENCY FIXTURE

WALLS & PARTITIONS

1 HR FIRE RATED HAZARD SEPARATION ALL DOORS AND OPENINGS SHALL BE PROTECTED BY A 45 MINUTE FIRE-RESISTANT EXCEPT AT STAIRS & SHAFTS. ALL DOORS AND PENETRATIONS INTO STAIRS AND SHAFTS SHALL HAVE A 60-MINUTE FIRE RESISTANCE RATING. ADDITIONAL PENETRATION OF STAIR SHAFTS IS NOT PERMITTED EXCEPT AS SPECIFICALLY EXCEPTED.

GENERAL NOTES:

1. SEAL ALL OPENINGS AND PENETRATIONS TO RESIST THE MIGRATION OF PASSAGE OF SMOKE AND GASES.
2. SPECIFIC EXCEPTIONS TO THE LISTED RATINGS MAY BE PERMITTED WHERE INDICATED.
3. FIRE RESISTANT ASSEMBLIES, MATERIALS, PROPERTIES AND THICKNESS REQUIRED, SHALL COMPLY WITH THOSE WHICH HAVE SUCCESSFULLY BEEN PERFORMED UNDER TESTS MADE BY A RECOGNIZED LABORATORY PER ASTM E119 OR BASED ON CALCULATIONS PERMITTED BY THE FBC AND BUILDING OFFICIAL.
4. SEE REFLECTED CEILING PLANS FOR REMAINDER OF LIGHTING.
5. FOR FIRE ALARM HORN, STROBE, PULL STATION, AND SMOKE DETECTORS REFER TO ELECTRICAL DRAWINGS.

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

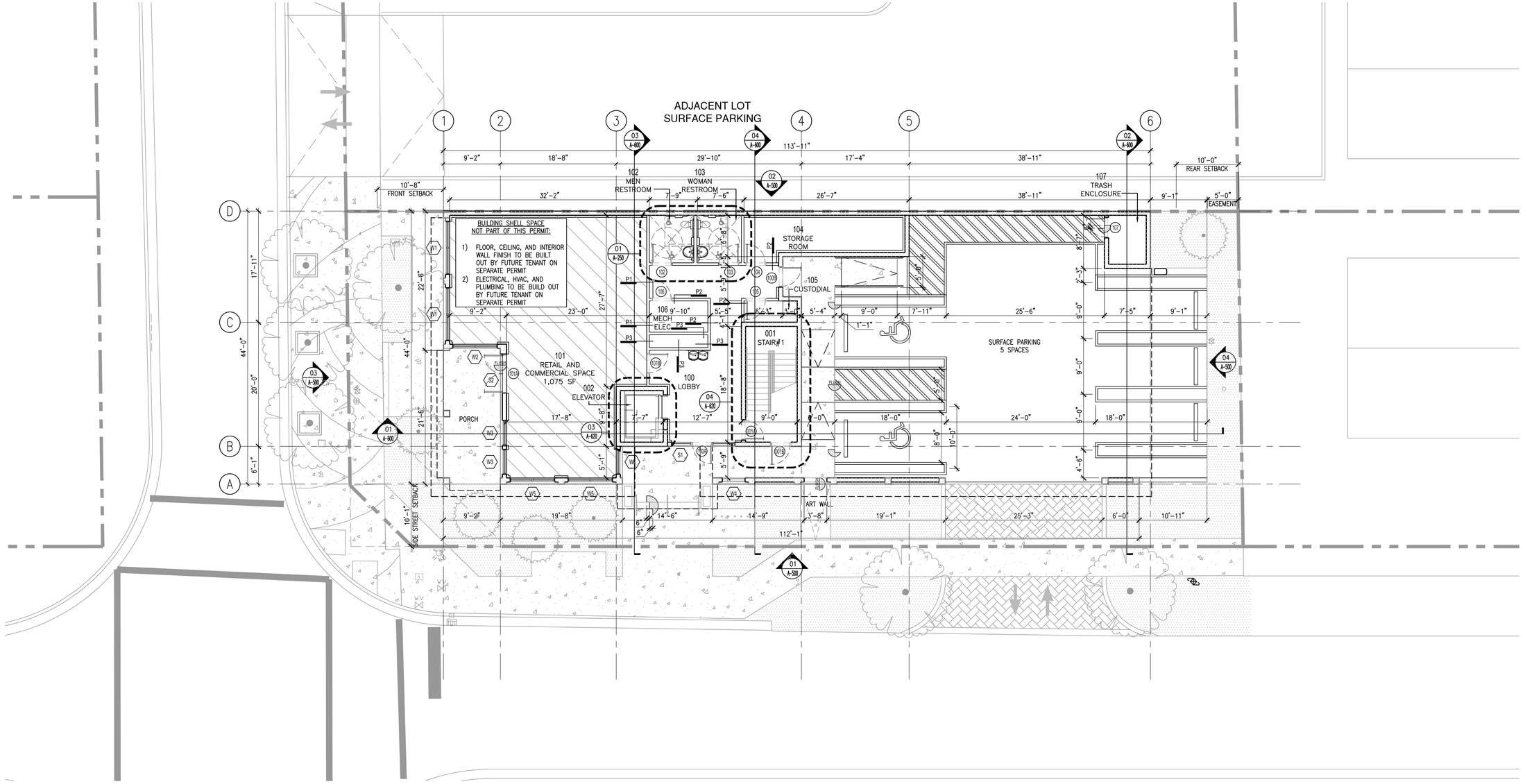
BUILDING DEPARTMENT COMMENTS 04-08-2022

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
LIFE SAFETY SECOND FLOOR PLAN

Sheet # :
LS-202



FIRST FLOOR PLAN

01

1/8" = 0'-0"

FLOOR PLAN LEGEND

EXISTING WALL

NEW DRYWALL / STUD PARTITION

DOOR KEY
BUILDING NUMBER
ROOM NUMBER
DOOR NUMBER

POINT ELEVATION TAG
DESCRIPTION
DESCRIPTION
0'-0"
DESCRIPTION OF OBJECT
HEIGHT

ROOM TAG
1-100
X
X
X
ROOM NUMBER
ROOM NAME

WALL TYPE TAG
P-XX

SYMBOLS

CR DOOR ACCESS CARD READER

WS ROLL-DOWN WINDOW SHADES

M MONITOR/TV WALL. REFER TO SHEET A-640 FOR INTERIOR ELEVATION

CODED NOTE TAG
1 CODED NOTE NUMBER

DOOR TAG
DOOR NUMBER
ROOM NUMBER
NOTE: REFER TO DOOR ELEVATIONS & SCHEDULES

GENERAL NOTES

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION. NOTIFY THE ARCHITECT OF ANY DISCREPANCIES OR ANY INCONSISTENCIES.
2. ALL DIMENSIONS FOR NEW WORK ARE TO FACE OF STUDS, FACE OF CMU OR CONC. AND CENTERLINES OF COLUMNS, UNLESS OTHERWISE INDICATED. ALL DIMENSIONS TO EXISTING ARE TO FACE OF FINISH UNLESS OTHERWISE INDICATED. DIMENSIONS TAKE PRECEDENCE OVER SCALING OF DRAWINGS.
3. INSTALL TYPICAL PARTITION TYPE P1 (REFER TO A-800) FOR ALL NEW PARTITIONS UNLESS OTHERWISE INDICATED.
4. ALL WOOD IN DIRECT CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE TREATED.
5. PROVIDE ALL REQUIRED BLOCKING AS NEEDED FOR EQUIPMENT SUPPORTS. COORDINATE WITH ALL TRADES AS REQUIRED. PROVIDE G-185 COATING FOR PT WOOD ANCHORS. REFER TO ASTM A123 AND A15
6. VERIFY SIZES OF ALL OWNER PROVIDED EQUIPMENT AND COORDINATE ALL OPENINGS, CLEARANCES, ELECTRICAL AND MECHANICAL REQUIREMENTS WITH THE OWNER PRIOR TO INSTALLATION.
7. UPON COMPLETION OF THE WORK, PROPERTY AND ADJACENT AREAS SHALL BE LEFT CLEAN AND SATISFACTORY TO THE OWNER AND THE ARCHITECT.
8. REFER TO A-800 SHEETS FOR ENLARGED INTERIOR DESIGN FLOOR PLAN DRAWINGS, FINISH LEGENDS, FINISH SCHEDULES, DETAILS AND LOCATIONS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING, PATCHING AND FITTING OF ALL WORK IN A NEAT WORKMANLIKE MANNER. PROTECT ALL ADJACENT SURFACES FROM DAMAGE. PATCH AND REPAIR ALL WORK DAMAGED DURING CONSTRUCTION TO IT'S ORIGINAL OR BETTER CONDITION. WHERE NEW WORK ADJOINS EXISTING IN THE SAME PLANE, MATCH ADJACENT FINISHES, MATERIALS, TEXTURES, SHEEN, ETC.
10. AT AREAS OF FLOOR SLAB REPLACEMENT (DUE TO DEMOLITION), PROVIDE VAPOR BARRIER SHEET, BACKFILL TRENCH, COMPACT AND REPLACE SLAB TO MATCH EXISTING ADJACENT IN ELEVATION, FINISH AND REINFORCEMENT.

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

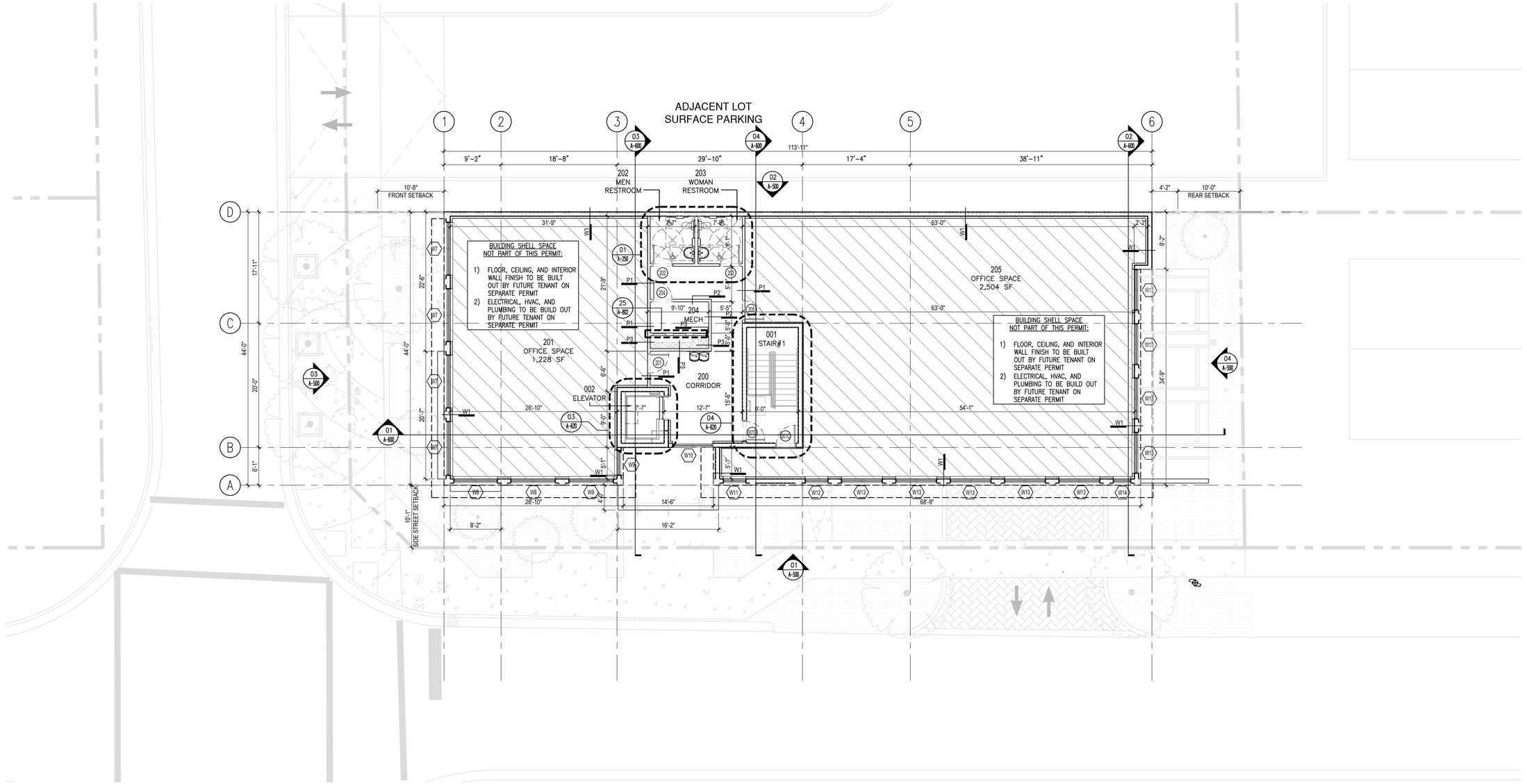
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

FIRST FLOOR PLAN

Sheet # :

A-201



FLOOR PLAN LEGEND

EXISTING WALL

NEW DRYWALL / STUD PARTITION

DOOR KEY
BUILDING NUMBER
ROOM NUMBER
DOOR NUMBER

POINT ELEVATION TAG
DESCRIPTION
DESCRIPTION
0'-0"
DESCRIPTION OF OBJECT
HEIGHT

ROOM TAG
1-100
X
X
X
ROOM NUMBER
ROOM NAME

WALL TYPE TAG
P-XX

SYMBOLS

CR DOOR ACCESS CARD READER

WS ROLL-DOWN WINDOW SHADES

M MONITOR/TV WALL. REFER TO SHEET A-640 FOR INTERIOR ELEVATION

CODED NOTE TAG
1 CODED NOTE NUMBER

DOOR TAG
DOOR NUMBER
ROOM NUMBER
NOTE: REFER TO DOOR ELEVATIONS & SCHEDULES

GENERAL NOTES

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION. NOTIFY THE ARCHITECT OF ANY DISCREPANCIES OR ANY INCONSISTENCIES.
2. ALL DIMENSIONS FOR NEW WORK ARE TO FACE OF STUDS, FACE OF CMU OR CONC. AND CENTERLINES OF COLUMNS, UNLESS OTHERWISE INDICATED. ALL DIMENSIONS TO EXISTING ARE TO FACE OF FINISH UNLESS OTHERWISE INDICATED. DIMENSIONS TAKE PRECEDENCE OVER SCALING OF DRAWINGS.
3. INSTALL TYPICAL PARTITION TYPE P1 (REFER TO A-800) FOR ALL NEW PARTITIONS UNLESS OTHERWISE INDICATED.
4. ALL WOOD IN DIRECT CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE TREATED.
5. PROVIDE ALL REQUIRED BLOCKING AS NEEDED FOR EQUIPMENT SUPPORTS. COORDINATE WITH ALL TRADES AS REQUIRED. PROVIDE G-185 COATING FOR PT WOOD ANCHORS. REFER TO ASTM A123 AND A15
6. VERIFY SIZES OF ALL OWNER PROVIDED EQUIPMENT AND COORDINATE ALL OPENINGS, CLEARANCES, ELECTRICAL AND MECHANICAL REQUIREMENTS WITH THE OWNER PRIOR TO INSTALLATION.
7. UPON COMPLETION OF THE WORK, PROPERTY AND ADJACENT AREAS SHALL BE LEFT CLEAN AND SATISFACTORY TO THE OWNER AND THE ARCHITECT.
8. REFER TO A-800 SHEETS FOR ENLARGED INTERIOR DESIGN FLOOR PLAN DRAWINGS, FINISH LEGENDS, FINISH SCHEDULES, DETAILS AND LOCATIONS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING, PATCHING AND FITTING OF ALL WORK IN A NEAT WORKMANLIKE MANNER. PROTECT ALL ADJACENT SURFACES FROM DAMAGE. PATCH AND REPAIR ALL WORK DAMAGED DURING CONSTRUCTION TO IT'S ORIGINAL OR BETTER CONDITION. WHERE NEW WORK ADJOINS EXISTING IN THE SAME PLANE, MATCH ADJACENT FINISHES, MATERIALS, TEXTURES, SHEEN, ETC.
10. AT AREAS OF FLOOR SLAB REPLACEMENT (DUE TO DEMOLITION), PROVIDE VAPOR BARRIER SHEET, BACKFILL TRENCH, COMPACT AND REPLACE SLAB TO MATCH EXISTING ADJACENT IN ELEVATION, FINISH AND REINFORCEMENT.

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054
STATE OF FLORIDA

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

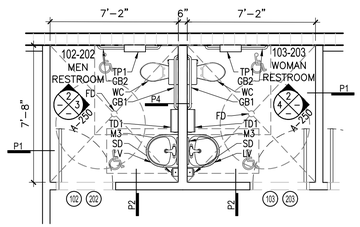
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

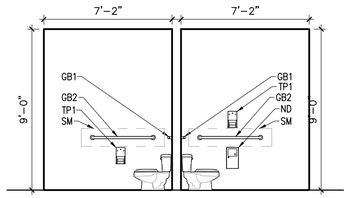
SECOND
FLOOR PLAN

Sheet # :

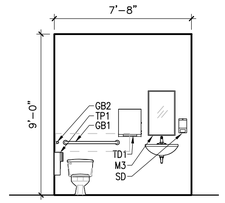
A-202



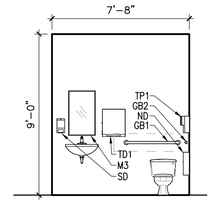
TYP. RESTROOM	01	
FIRST AND SECOND FLOOR	1/4" = 1'-0"	



RESTROOM ELEVATION	02
FIRST AND SECOND FLOOR	1/4" = 1'-0"



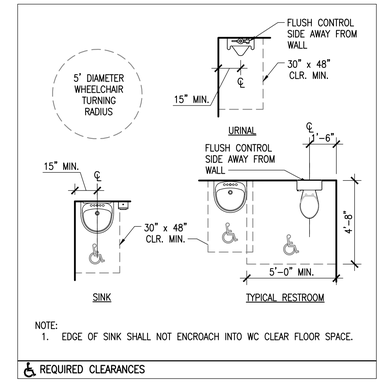
RESTROOM ELEVATION	03
FIRST AND SECOND FLOOR	1/4" = 1'-0"



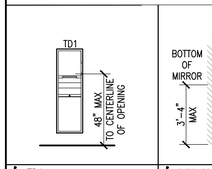
RESTROOM ELEVATION	04
FIRST AND SECOND FLOOR	1/4" = 1'-0"

FIXTURE & ACCESSORY LEGEND

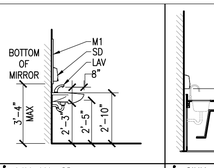
TAG	DESCRIPTION	MODEL #
DH	DOOR HOOK	BOBRICK B-2116
WC	FLOOR MOUNTED TANK WATER CLOSET	
FD	FLOOR DRAIN	SCHLUTER-KERDI-LINE
GB1	GRAB BAR - 36"L	BRADLEY #812
GB2	GRAB BAR - 42"L	BRADLEY #812
GB3	GRAB BAR - 18"L	BRADLEY #812
GB4	GRAB BAR - 24"L	BRADLEY #812
M1	MIRROR - 48"WX30"H WITH 1/4"W METAL FRAME	BRADLEY #780-4830
M2	MIRROR - 36"WX30"H WITH 1/4"W METAL FRAME	BRADLEY #780-3630
M3	MIRROR - 18"WX30"H WITH 1/4"W METAL FRAME	BRADLEY #780-1830
LV	ADA LAVATORY	
PT	PARTITIONS-SCANTRON	EQUPSE PARTITIONS
SC	SHOWER CURTAIN; ANTIMICROBIAL	BRADLEY #9533-WHITE
SCH	SHOWER CURTAIN HOOKS	BRADLEY #9536
SCR	SHOWER CURTAIN ROD	BRADLEY #9538
SD	SOAP DISPENSER	BRADLEY #6563
SH	SOAP HOLDER	BRADLEY #900
SHA	SHOWER HEAD - ADJUSTABLE	BRADLEY HAND SHOWER
SHC	SHOWER CONTROLS	BRADLEY #S59-1001
SS	FOLDING SHOWER SEAT	BRADLEY #9593
TD1	SURFACE MOUNTED WASTE/PAPER TOWEL DISPENSER	BOBRICK #B-3979
TP1	SURFACE MOUNTED MULTI ROLL TOILET PAPER DISPENSER	BOBRICK #B-4288
SM	22GA SHEET METAL BACKING, SPAN FROM 27" TO 41" AFF	
EWC	ELECTRIC WATER COOLER	ELKAY #LZSTL8WSSP



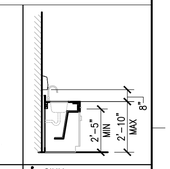
REQUIRED CLEARANCES



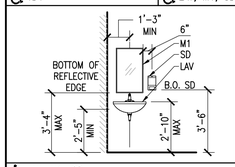
TD1



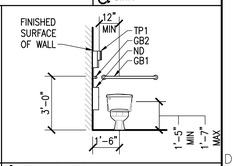
LAV, M1, SD



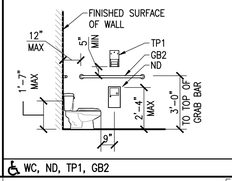
SINK



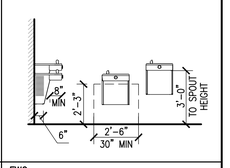
LAV, M1, SD



TP1, ND, GB36



WC, ND, TP1, GB2



EWC

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
STATE OF FLORIDA
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

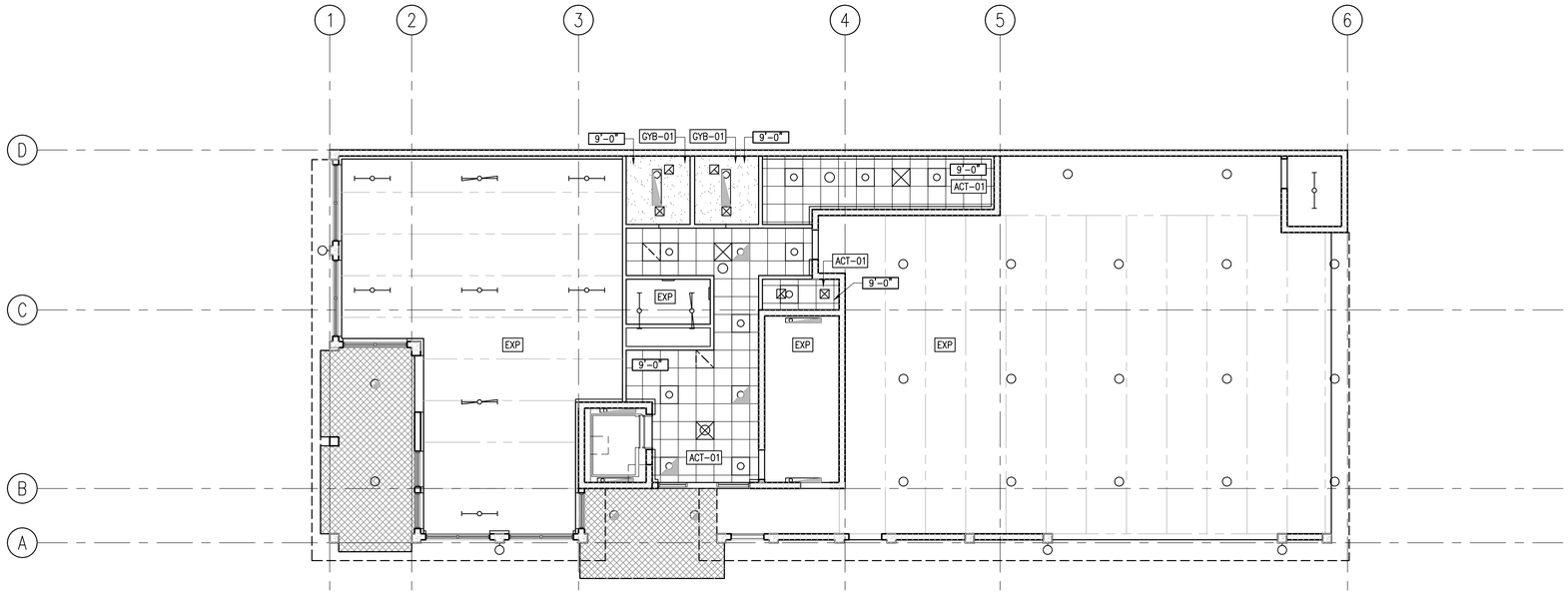
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

ENLARGED RESTROOM FLOOR PLAN

Sheet # :

A-250



GENERAL NOTES

1. ALL FIXTURES AND DEVICES SHALL BE INSTALLED ON THE CENTERLINE OF CEILING TILE OR SPACE UNLESS OTHERWISE NOTED.
2. ALL SOFFITS SHALL ALIGN WITH WALLS OR CORNERS AT ALL LOCATIONS WHERE SOFFITS MEET WALLS OR CORNERS AS TO PROVIDE A FLUSH FINISH.
3. TAPE AND FINISH ALL INSIDE JOINTS.
4. PROVIDE CORNER BEADS FOR ALL OUTSIDE JOINTS.
5. CONTRACTOR TO COORDINATE ALL DISCIPLINES TO ENSURE ALL DUCTWORK, EQUIPMENT, FIXTURES, PIPES, CONDUITS, SUSPENSION AND ACOUSTIC SYSTEMS NECESSARY TO MAINTAIN CEILING ELEVATIONS.
6. CONTRACTOR TO COORDINATE ALL DUCT LOCATIONS WITH OTHER TRADES. ARCHITECT TO REVIEW AND HAVE FINAL APPROVAL FOR ALL EXPOSED CEILING SURFACES.
7. ALL EXTERIOR STUCCO CEILING FRAMING TO BE PROVIDED IN SHOP DRAWINGS BY SPECIFIED STRUCTURAL ENGINEER.
8. CONTROL AREA SALLY PORT, HOLDING CELLS AND ARMORY TO PROVIDE VANDAL PROOF LENS MATERIAL AND FIXTURE
9. WHERE ALL 2X4 LIGHT FIXTURES OCCUR IN THE CEILING GRID THE GRID SHALL BE SUPPORTED AT ALL (4) FOUR CORNERS WITH HANGER WIRE. LIGHTS SHALL BE MECHANICALLY FASTENED TO CEILING GRID BY CEILING SUBCONTRACTOR. "CLIPPED" LIGHT FIXTURES ARE NOT ALLOWED.
10. SMALL ADJUSTMENTS (LESS THAN 12") TO CEILING GRIDS ARE PERMISSIBLE PER FIELD CONDITIONS TO MAINTAIN FULL CEILING TILES TO THE GREATEST EXTENT POSSIBLE AND THAT CUT TILES ARE TO THE LARGEST DIMENSION POSSIBLE.
11. ALL CEILINGS AT FIRST FLOOR ARE TO BE INSTALLED AT 10'-0" AFF UNLESS NOTED OTHERWISE.
    ALL CEILINGS AT SECOND FLOOR ARE TO BE INSTALLED AT 9'-6" AFF UNLESS NOTED OTHERWISE.
12. PRIOR TO INSTALLATION OF ANY 8" DIA. LIGHT FIXTURE (a TO g), A MOUNTING HEIGHT MOCK-UP MUST BE PROVIDED FOR THE OWNER AND ARCHITECT'S REVIEW. SIGN-OFF BY EACH WILL BE REQUIRED PRIOR TO ANY PERMANENT INSTALLATION. FAILURE TO DO SO MAY RESULT IN ADDITIONAL WORK AT THE CONTRACTOR'S EXPENSE.

FIRST FLOOR RCP PLAN | 01 | 1/8" = 0'-0"

REFLECTED CEILING LEGEND

- 2X2 LAY-IN FIXTURE
- 2X2 LAY-IN FIXTURE EMERGENCY
- CAN FIXTURE
- CAN FIXTURE EMERGENCY
- 6"x4' LAY-IN FIXTURE
- 6"x4' LAY-IN FIXTURE EMERGENCY
- 1X6 SURFACE MOUNTED FIXTURE
- 1X6 SURFACE MOUNTED FIXTURE EMERGENGY
- 3"X4"X4'-0" LONG LINEAR WALL LIGHT FIXTURE
- LIGHTED EXIT SIGN SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED
- LIGHTED EXIT SIGN DOUBLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED
- LIGHTED DIRECTIONAL EXIT SIGN SINGLE FACED ARROW INDICATES DIRECTION(S) TO EXIT
- LIGHTED DIRECTIONAL EXIT SIGN DOUBLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

- RETURN AIR GRILLE
- SUPPLY AIR GRILLE
- EXHAUST GRILLE

NOTE: SPRINKLER, SMOKE AND HEAT DETECTOR SHOWN IN SEPARATE DRAWINGS

- EXP — EXPOSED STRUCTURE
- C.J. — PLASTER/ VENEER PLASTER
- 2' X 2' LAY IN ACOUSTICAL CEILING TILE
- 2' X 4' LAY IN ACOUSTICAL CEILING TILE
- GWB CEILING SOFFIT / BULKHEAD
- STUCCO CEILING / SOFFIT

DETAIL SECTION TAG: XX/XXX — SHEET NUMBER / DETAIL NUMBER

CEILING HEIGHT TAG: 0'-0" — CEILING HEIGHT (AFF); 0'-0" / ACTX — FINISH TYPE

CEILING TYPES

TYPE	LOCATION	DESCRIPTION
ACT1	LOBBY, CUSTODIAL, STORAGE	ARMSTRONG CALLA HIGH CAC # 8807. SUPRAFINE XL 9/16" GRID #7500
GYB1	RESTROOMS	PAINTED GYPSUM BOARD HARD CEILING
EXP	TENANT SPACE, GARAGE, STAIR AND ELECTRICAL	NO CEILING, EXPOSED STRUCTURE

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

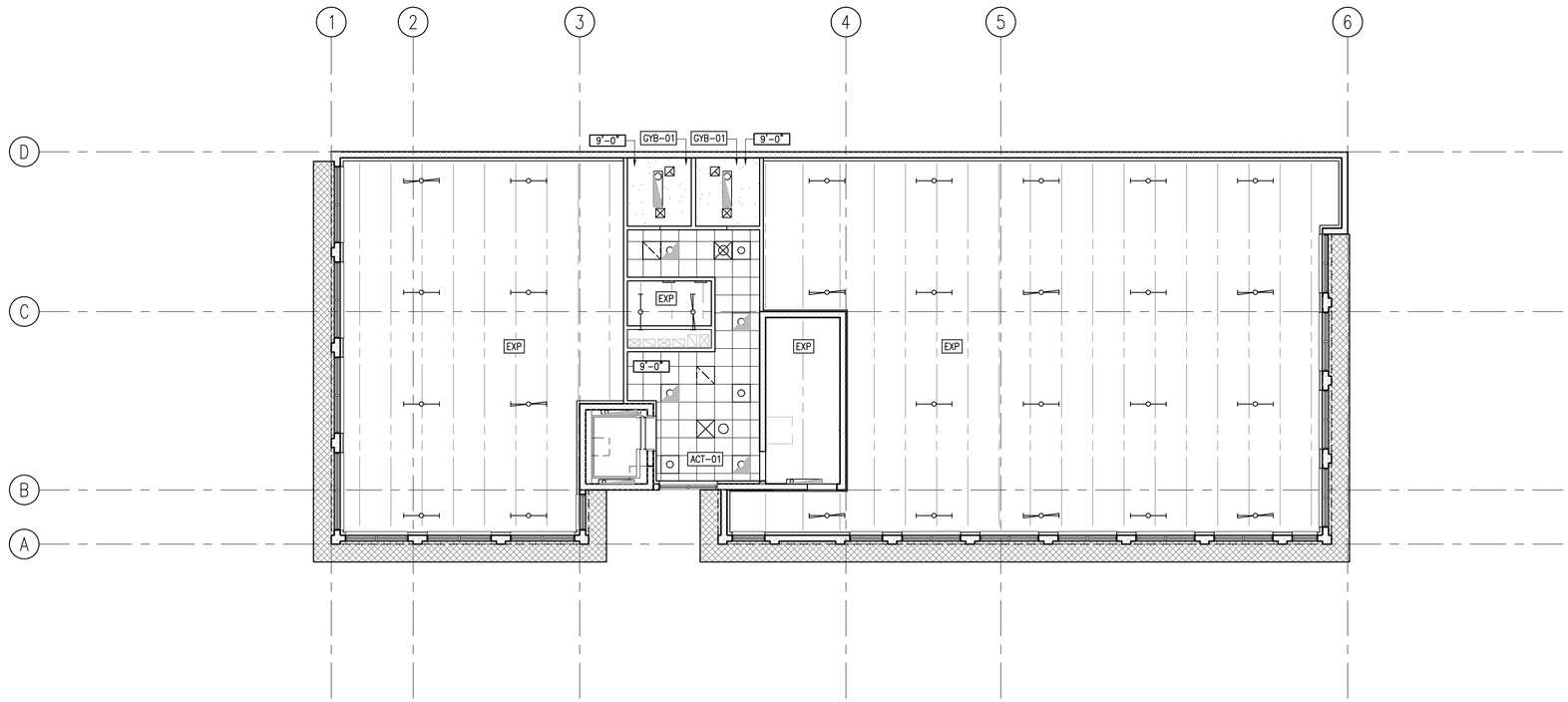
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FIRST FLOOR REFLECTED CEILING PLAN

Sheet # :
A-301



GENERAL NOTES

1. ALL FIXTURES AND DEVICES SHALL BE INSTALLED ON THE CENTERLINE OF CEILING TILE OR SPACE UNLESS OTHERWISE NOTED.
2. ALL SOFFITS SHALL ALIGN WITH WALLS OR CORNERS AT ALL LOCATIONS WHERE SOFFITS MEET WALLS OR CORNERS AS TO PROVIDE A FLUSH FINISH.
3. TAPE AND FINISH ALL INSIDE JOINTS.
4. PROVIDE CORNER BEADS FOR ALL OUTSIDE JOINTS.
5. CONTRACTOR TO COORDINATE ALL DISCIPLINES TO ENSURE ALL DUCTWORK, EQUIPMENT, FIXTURES, PIPES, CONDUITS, SUSPENSION AND ACOUSTIC SYSTEMS NECESSARY TO MAINTAIN CEILING ELEVATIONS.
6. CONTRACTOR TO COORDINATE ALL DUCT LOCATIONS WITH OTHER TRADES. ARCHITECT TO REVIEW AND HAVE FINAL APPROVAL FOR ALL EXPOSED CEILING SURFACES.
7. ALL EXTERIOR STUCCO CEILING FRAMING TO BE PROVIDED IN SHOP DRAWINGS BY SPECIFIED STRUCTURAL ENGINEER.
8. CONTROL AREA SALLY PORT, HOLDING CELLS AND ARMORY TO PROVIDE VANDAL PROOF LENS MATERIAL AND FIXTURE
9. WHERE ALL 2X4 LIGHT FIXTURES OCCUR IN THE CEILING GRID THE GRID SHALL BE SUPPORTED AT ALL (4) FOUR CORNERS WITH HANGER WIRE. LIGHTS SHALL BE MECHANICALLY FASTENED TO CEILING GRID BY CEILING SUBCONTRACTOR. "CLIPPED" LIGHT FIXTURES ARE NOT ALLOWED.
10. SMALL ADJUSTMENTS (LESS THAN 12") TO CEILING GRIDS ARE PERMISSIBLE PER FIELD CONDITIONS TO MAINTAIN FULL CEILING TILES TO THE GREATEST EXTENT POSSIBLE AND THAT CUT TILES ARE TO THE LARGEST DIMENSION POSSIBLE.
11. ALL CEILINGS AT FIRST FLOOR ARE TO BE INSTALLED AT 10'-0" AFF UNLESS NOTED OTHERWISE.
    ALL CEILINGS AT SECOND FLOOR ARE TO BE INSTALLED AT 9'-6" AFF UNLESS NOTED OTHERWISE.
12. PRIOR TO INSTALLATION OF ANY 8" DIA. LIGHT FIXTURE (a TO g), A MOUNTING HEIGHT MOCK-UP MUST BE PROVIDED FOR THE OWNER AND ARCHITECT'S REVIEW. SIGN-OFF BY EACH WILL BE REQUIRED PRIOR TO ANY PERMANENT INSTALLATION. FAILURE TO DO SO MAY RESULT IN ADDITIONAL WORK AT THE CONTRACTOR'S EXPENSE.

FIRST FLOOR RCP PLAN | 01 | 1/8" = 0'-0"

REFLECTED CEILING LEGEND

- 2X2 LAY-IN FIXTURE
- 2X2 LAY-IN FIXTURE EMERGENCY
- CAN FIXTURE
- CAN FIXTURE EMERGENCY
- 6"x4' LAY-IN FIXTURE
- 6"x4' LAY-IN FIXTURE EMERGENCY
- 1X6 SURFACE MOUNTED FIXTURE
- 1X6 SURFACE MOUNTED FIXTURE EMERGENGY
- 3"X4"X4'-0" LONG LINEAR WALL LIGHT FIXTURE
- LIGHTED EXIT SIGN SINGLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED
- LIGHTED EXIT SIGN DOUBLE FACED DARKENED AREA INDICATES FACE OF SIGN VIEWED
- LIGHTED DIRECTIONAL EXIT SIGN SINGLE FACED ARROW INDICATES DIRECTION(S) TO EXIT
- LIGHTED DIRECTIONAL EXIT SIGN DOUBLE FACED ARROW INDICATES DIRECTION(S) TO EXIT

- RETURN AIR GRILLE
- SUPPLY AIR GRILLE
- EXHAUST GRILLE

NOTE: SPRINKLER, SMOKE AND HEAT DETECTOR SHOWN IN SEPARATE DRAWINGS

- EXP — EXPOSED STRUCTURE
- C.J. — PLASTER/ VENEER PLASTER
- 2' X 2' LAY IN ACOUSTICAL CEILING TILE
- 2' X 4' LAY IN ACOUSTICAL CEILING TILE
- GWB CEILING SOFFIT / BULKHEAD
- STUCCO CEILING / SOFFIT

DETAIL SECTION TAG: XX/XXX — SHEET NUMBER / DETAIL NUMBER

CEILING HEIGHT TAG: 0'-0" — CEILING HEIGHT (AFF); 0'-0" / ACTX — FINISH TYPE

CEILING TYPES

TYPE	LOCATION	DESCRIPTION
ACT1	LOBBY, CUSTODIAL, STORAGE	ARMSTRONG CALLA HIGH CAC # 8807. SUPRAFINE XL 9/16" GRID #7500
GYB1	RESTROOMS	PAINTED GYPSUM BOARD HARD CEILING
EXP	TENANT SPACE, GARAGE, STAIR AND ELECTRICAL	NO CEILING, EXPOSED STRUCTURE

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

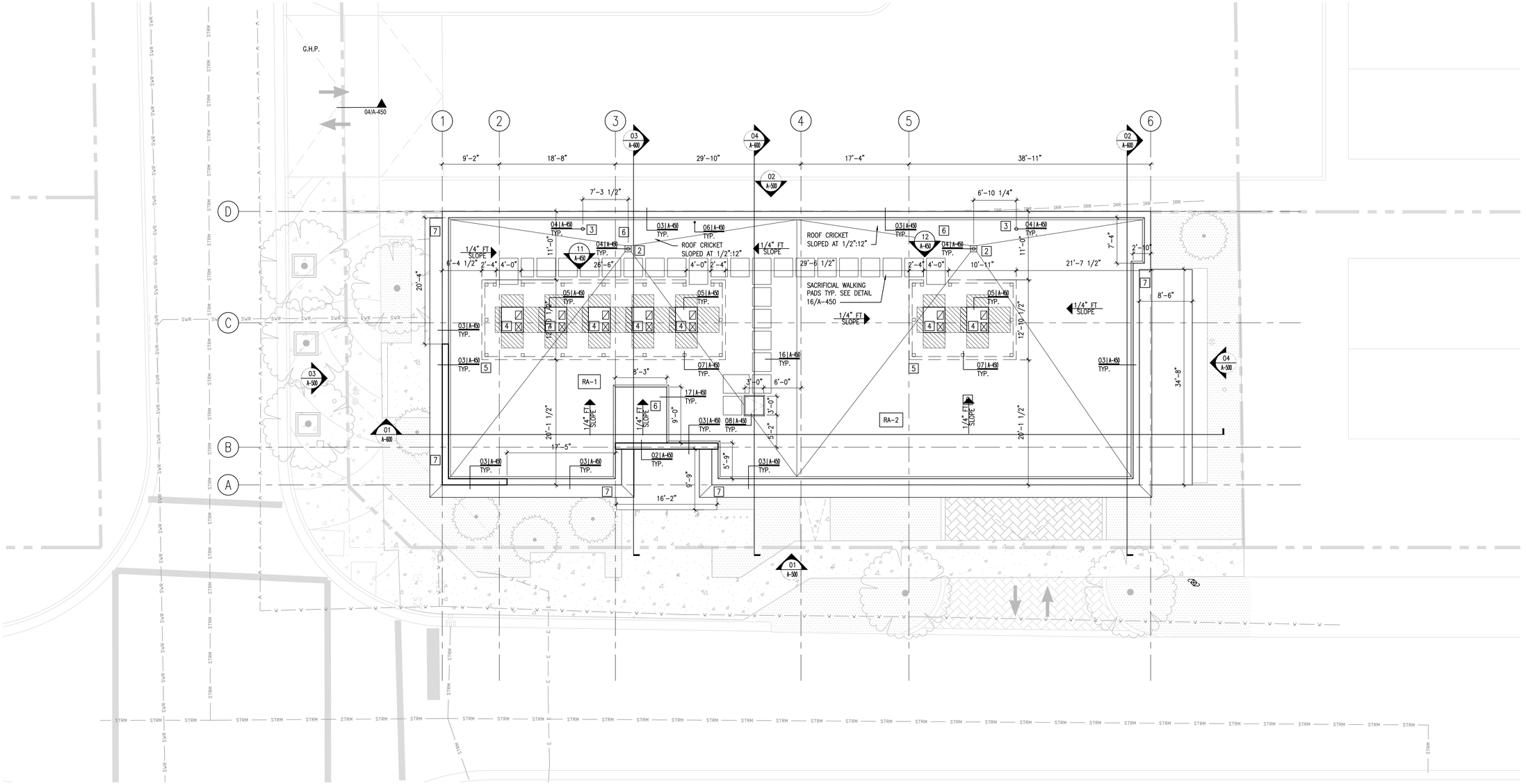
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
SECOND FLOOR REFLECTED CEILING PLAN

Sheet # :
A-302



OVERALL ROOF PLAN

01

1/8" = 0'-0"

CODED NOTES

1. EXPANSION JOINT. REFER TO STRUCTURAL
2. 6" DIAMETER INTERIOR ROOF DRAIN. REFER TO PLUMBING
3. SECONDARY EMERGENCY OVERFLOW SCUPPER
4. R.T.U. REFER TO MECHANICAL
5. PREMANUFCTURED PREFINISHED METAL LOUVRE
6. CRICKET ¼" PER 1' SLOPE
7. CONCRETE EYEBROW

ROOF PLAN LEGEND

NEW WORK
ROOF TYPE A-A
REFER TO ROOF LEGEND, AND TAG-105 ROOF DECK TYPE A
ROOF TYPE A-C
REFER TO ROOF LEGEND, AND TAG-105 ROOF DECK TYPE C
EXISTING TO REMAIN
ROOF TYPE A-A
REFER TO ROOF LEGEND, AND TAG-105 ROOF DECK TYPE B
ROOF TYPE A-C
REFER TO ROOF LEGEND
DETAIL TAG
DETAIL NUMBER
SHEET NUMBER
ELEVATION DATUM
LOCATION
DATUM
HEIGHT
CODED NOTE TAG
CODED NOTE NUMBER
REVISION NOTE TAG
REVISION NUMBER

ALL PRODUCT APPROVALS FOR ROOFING, WINDOWS, EXTERIOR DOORS, ROOF HATCH, AND LOUVERS ARE BEING DEFERRED TO THE CONTRACTOR IN THE SHOP DRAWING SUBMITTAL PHASE.

ROOF DRAINAGE CALCULATIONS

ROOF AREA NO.	ROOF AREA SF	PARAPET (2 x AREA)	TOTAL PROJECTED AREA SF	PRIMARY DOWNSPOUTS: DRAINS PROVIDED	DRAIN DIA.	ROOF AREA PROVIDED FOR	SECONDARY SCUPPER CALCULATIONS: SCUPPERS PROVIDED	WEIR WIDTH X HEAD HEIGHT	ROOF AREA PROVIDED FOR
BUILDING 1									
RA-1	2366	201	2567	1	6"	10800	1	4" X 8"	5742
RA-2	2,400	215	2793	1	6"	10,800	1	4" X 8"	5742

NOTES:
(1) BASED ON 5" RAINFALL PER HR
(2) BASED ON 4" HEAD HEIGHT CLEAR OPENING W/O ROOFING MATERIAL.
(3) FIELD VERIFY ALL SCUPPER DIMENSIONS.
(4) ALL WORKING SCUPPERS TO HAVE 4" MIN. CLEAR HEIGHT AFTER INSTALLATION OF ROOFING MATERIAL OR FLASHING.
(5) CONTRACTOR TO FIELD VERIFY ALL ROOF AREAS. DIMENSIONS TAKEN FROM AS BUILT DRAWINGS. CONFIRMATION REQUIRED

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

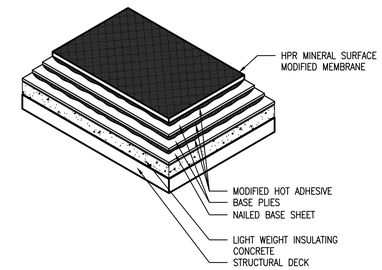
Phase :
100% CONSTRUCTION DOCUMENTS

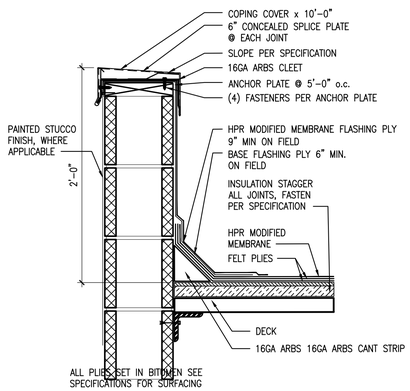
Sheet Title :

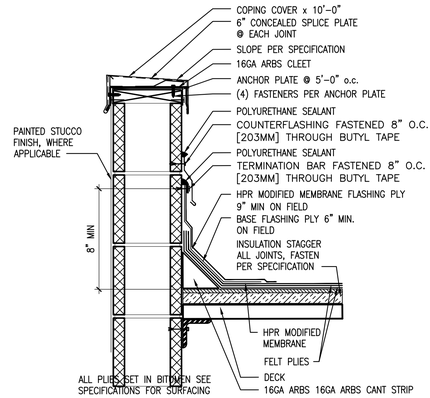
ROOF PLAN

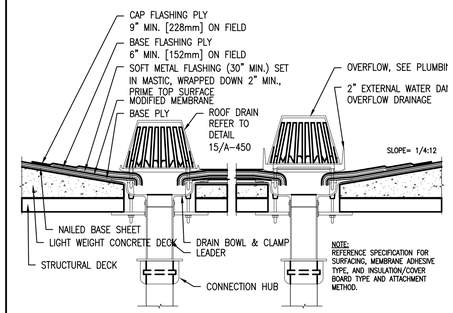
Sheet # :

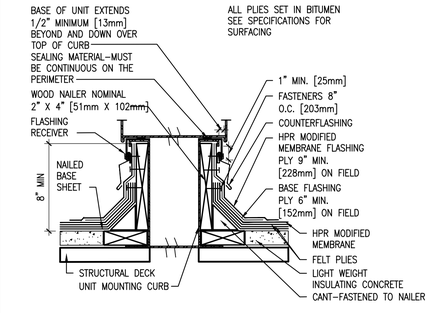
A-401

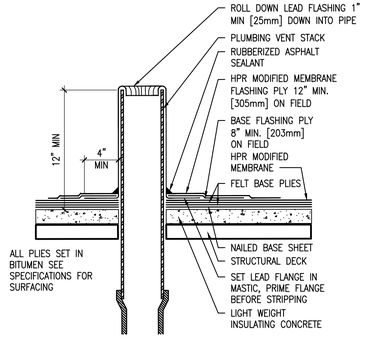


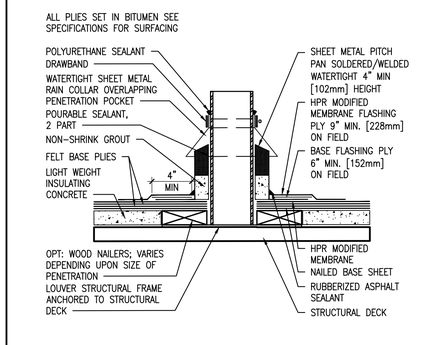


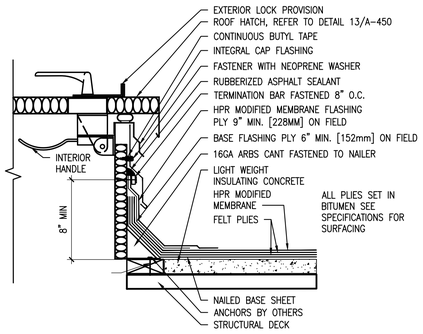


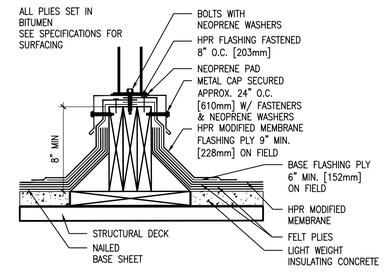


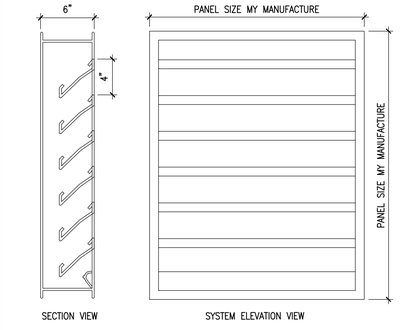


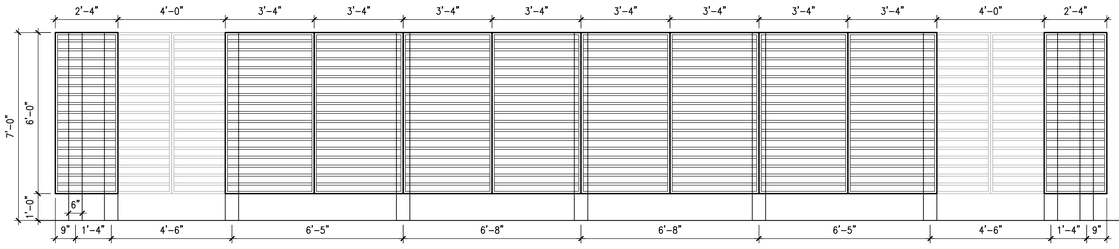




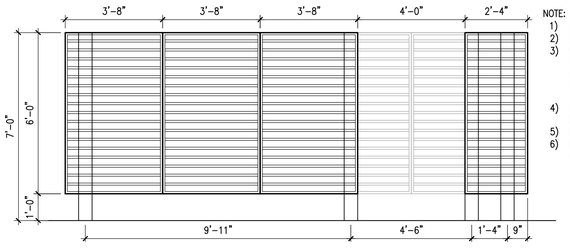




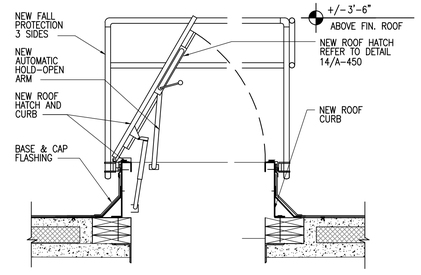


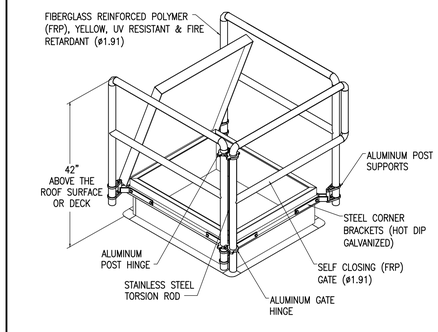


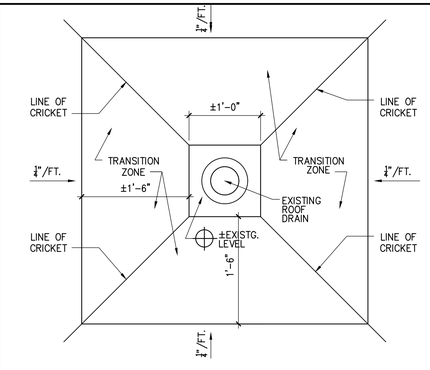
NOTE:
1) EXTRUDED ALUMINUM BLADE
2) EXTRUDED ALUMINUM FRAME
3) CONTRACTOR TO PROVIDE ENGENDERED STRUCTURAL SIGNED AND SEALED SHOP DRAWINGS FOR BUILDING DEPARTMENT REVIEW PRIOR TO PURCHASE AND INSTALLATION.
4) SHOP DRAWING DESIGN MUST CONTAIN WIND LOAD CALCULATIONS
5) IMPACT RESISTANT
6) BASIS OF DESIGN NOA# 18.0222.10 OR APPROVED EQUAL

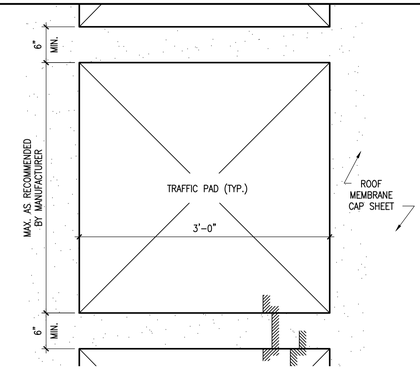


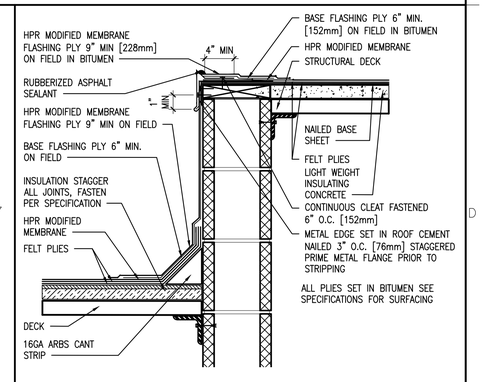
NOTE:
1) EXTRUDED ALUMINUM BLADE
2) EXTRUDED ALUMINUM FRAME
3) CONTRACTOR TO PROVIDE ENGENDERED STRUCTURAL SIGNED AND SEALED SHOP DRAWINGS FOR BUILDING DEPARTMENT REVIEW PRIOR TO PURCHASE AND INSTALLATION.
4) SHOP DRAWING DESIGN MUST CONTAIN WIND LOAD CALCULATIONS
5) IMPACT RESISTANT
6) BASIS OF DESIGN NOA# 18.0222.10 OR APPROVED EQUAL











宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
STATE OF FLORIDA
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022
CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

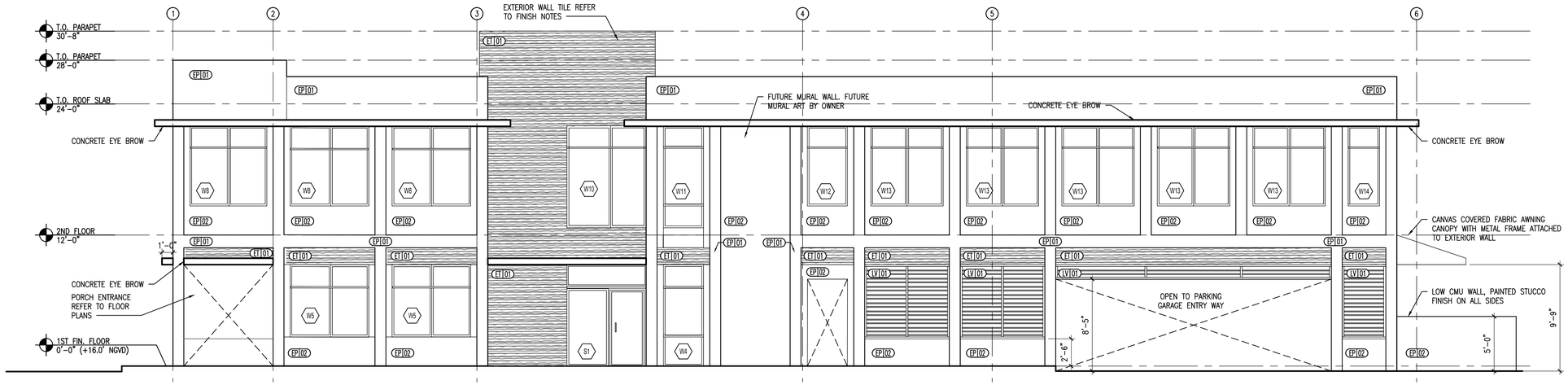
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No : ENTER NAME
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

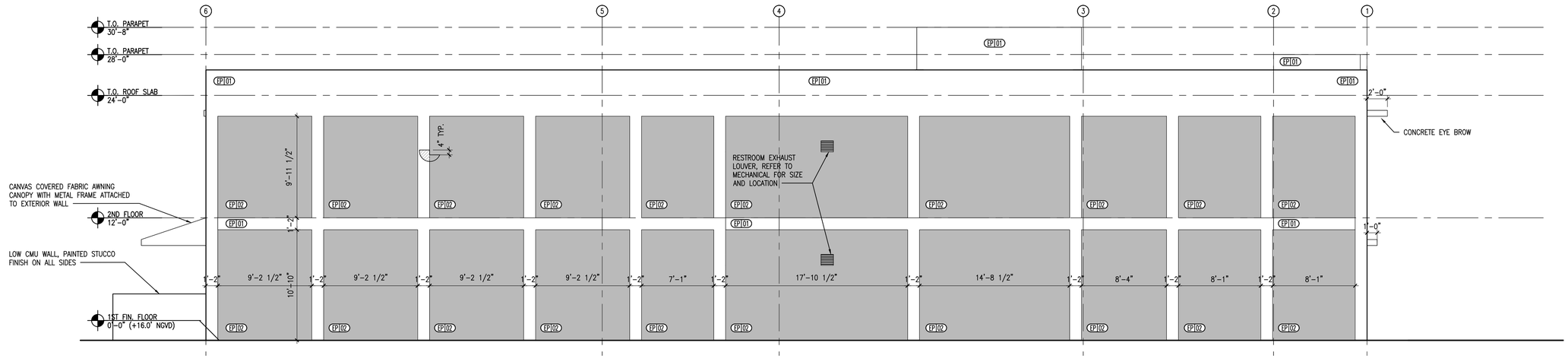
Sheet Title :
ROOF PLAN DETAILS

Sheet # :
A-450



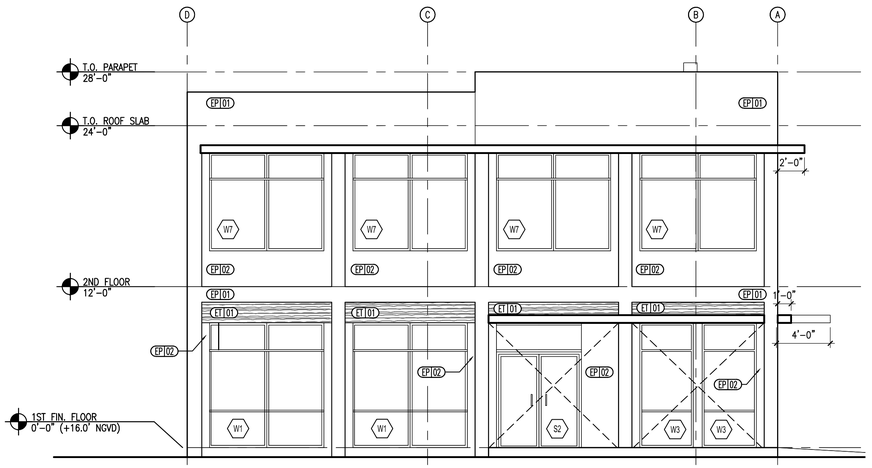
BUILDING SOUTH ELEVATION — 01

3/16" = 1'-0"



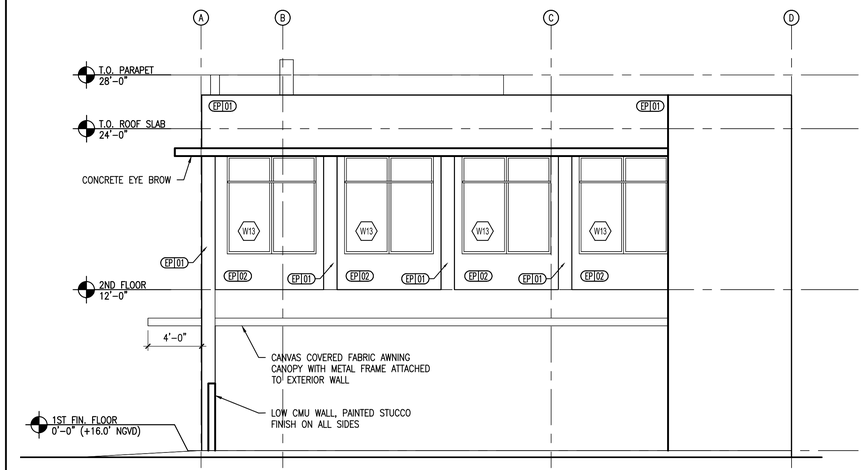
BUILDING NORTH ELEVATION — 02

3/16" = 1'-0"



BUILDING WEST ELEVATION — 03

3/16" = 1'-0"



BUILDING EAST ELEVATION — 04

3/16" = 1'-0"

EXTERIOR FINISH LEGEND

(EP01) PAINTED STUCCO – CUCUMBER
SHERWIN WILLIAMS
SW6722 CUCUMBER

(EP02) PAINTED STUCCO – WHITE
SHERWIN WILLIAMS
SW7551 GREEK VILLA

(ET01) EXTERIOR WALL TILE – CROSSVILLE INC AV363 BLISSFUL OLIVE 8X36 WOOD FINISH OR APPROVED EQUAL
- EXTERIOR WALL TILE (ET01)
  - EXTERIOR FINISH SPECIFICATION
    - INSTALLATION COMPANY WILL FOLLOW ANSI STANDARDS FOR PORCELAIN PLANK TILES USING THE BACK BUTTER INSTALLATION METHOD AS SUBSTRATE MUST BE FLAT WITH MAXIMUM VARIANCE OF 1/8" WITHIN 10 FEET.
    - A WATERPROOFING LIQUID WILL BE APPLIED TO SUBSTRATE USING LATICRETE HYDROBAN, LATICRETE 254 PLATINUM IS RECOMMENDED OR APPROVED EQUAL FOR THINSET INSTALL METHOD AS A SILICONE SEALANT OF LATASIL WILL BE USED AROUND THE PERIMETER AND OVER ANY EXPANSION JOINTS IF NEEDED.
    - BASIS OF DESIGN CROSSVILLE INC AV363 BLISSFUL OLIVE 8X36, D&B TILE DISTRIBUTORS MAITIA ALVAREZ 754-228-7259
  - SHALL BE DIRECT BONDED ONLY, NO SPOT BONDING ALLOWED BY CODE.
  - ADHESIVE SHALL HAVE FULL TILE COVERAGE
  - PRIOR TO TILE INSTALLATION CMU WALL TO BE FLATTENED TO 1/8" DISCREPANCY MARGIN FOR EVERY 10' IN LENGTH
  - MORTAR TO BE LOW LATEX IN ORDER TO AVOID EFFLORESCENCE
  - FOLLOW MANUFACTURES INSTRUCTIONS AND INSTALLATION DETAILS
  - COORDINATE PRE INSTALLATION ON SITE MEETING WITH TILE MANUFACTURE PRIOR TO INSTALLATION OF TILE, TO INSURE PROPER INSTALLATION PROCEDURES ARE TO BE FOLLOWED.
  - ON INSTALLATION TIME, HAVE A MANUFACTURE REPRESENTATIVE ON SITE.
  - REFER TO SPECIFICATION FOR MORE INFORMATION

(SF01) STOREFRONT/WINDOW/DOOR FRAMES
ALUMINUM FINISH

(LV01) DECORATIVE METAL HORIZONTAL WOOD-GRAIN FINISH
LOUVERS, CONTRACTOR TO PROVIDE NOA/SHOP DRAWINGS FOR APPROVAL

(MT01) OVERHANGS – METAL FINISH

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — STATE OF FLORIDA — AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

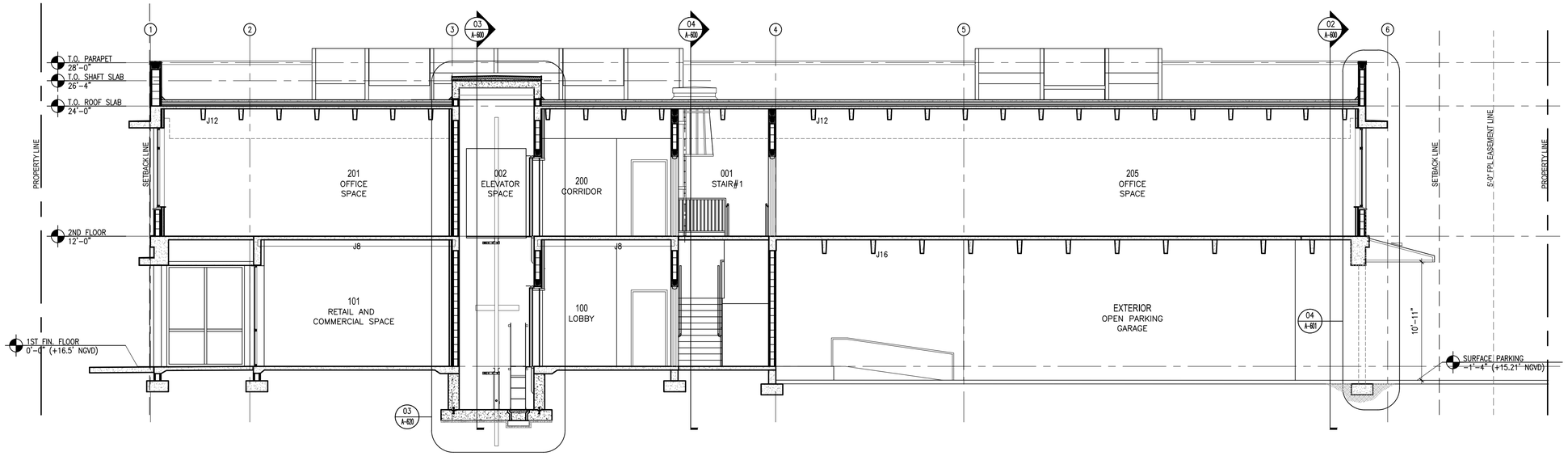
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
EXTERIOR ELEVATIONS

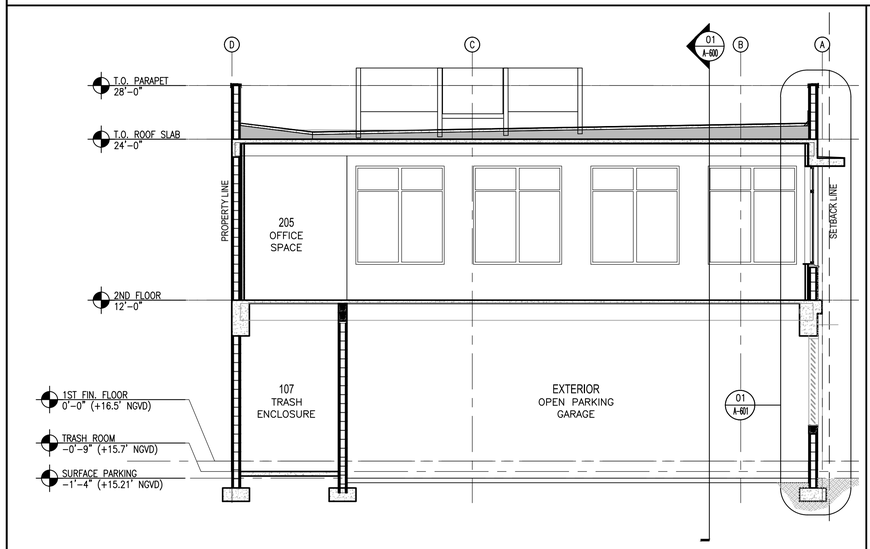
Sheet # :
A-500



BUILDING SECTION 1

01

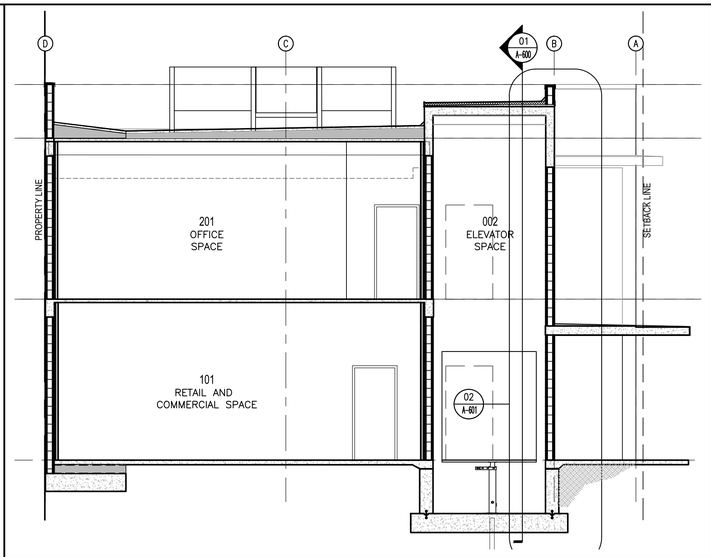
3/16" = 1'-0"



BUILDING SECTION 2

02

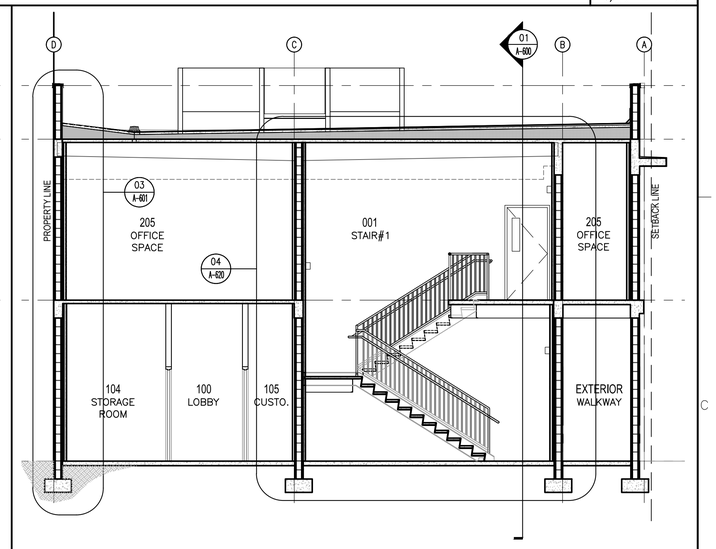
3/16" = 1'-0"



BUILDING SECTION 3

03

3/16" = 1'-0"



BUILDING SECTION 4

04

3/16" = 1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
STATE OF FLORIDA
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

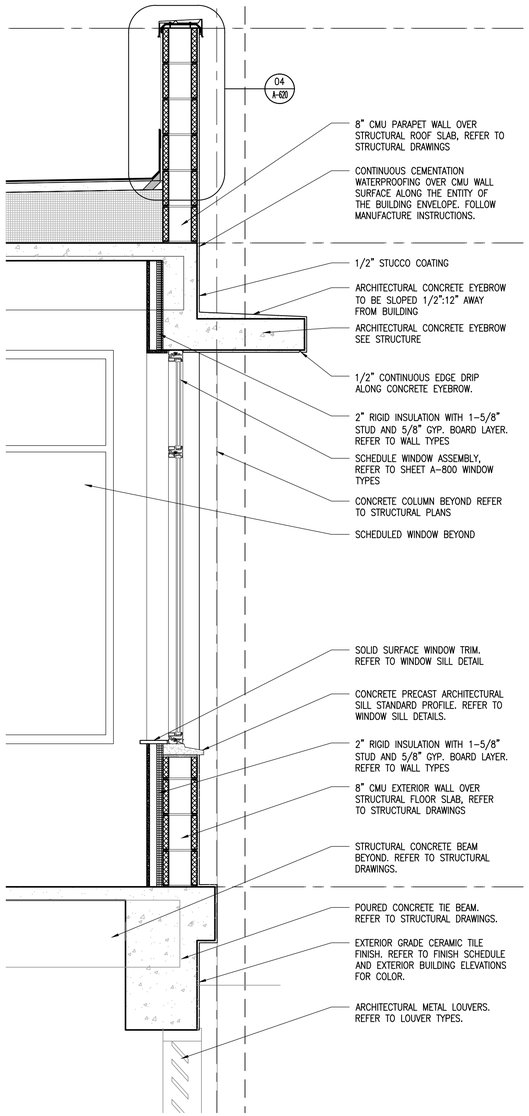
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

SECTIONS

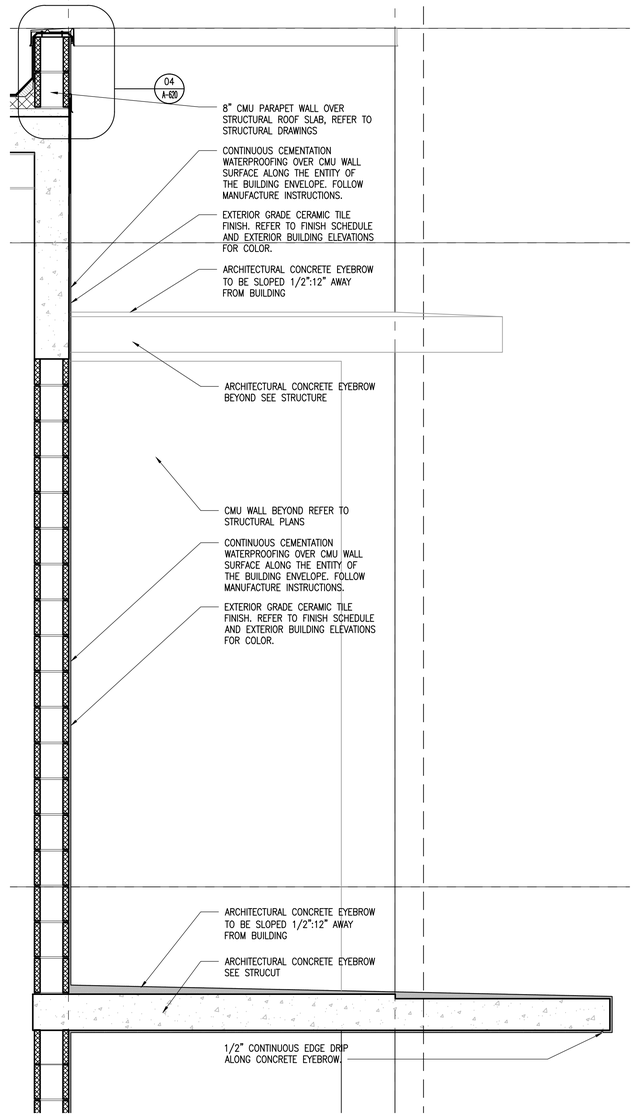
Sheet # :

A-600



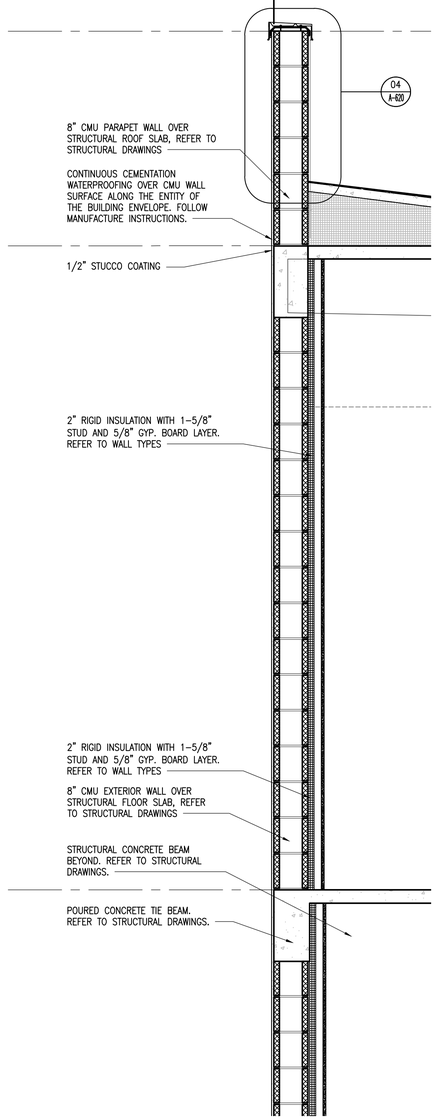
WALL SECTION 01

– – 3/4" = 1'–0"



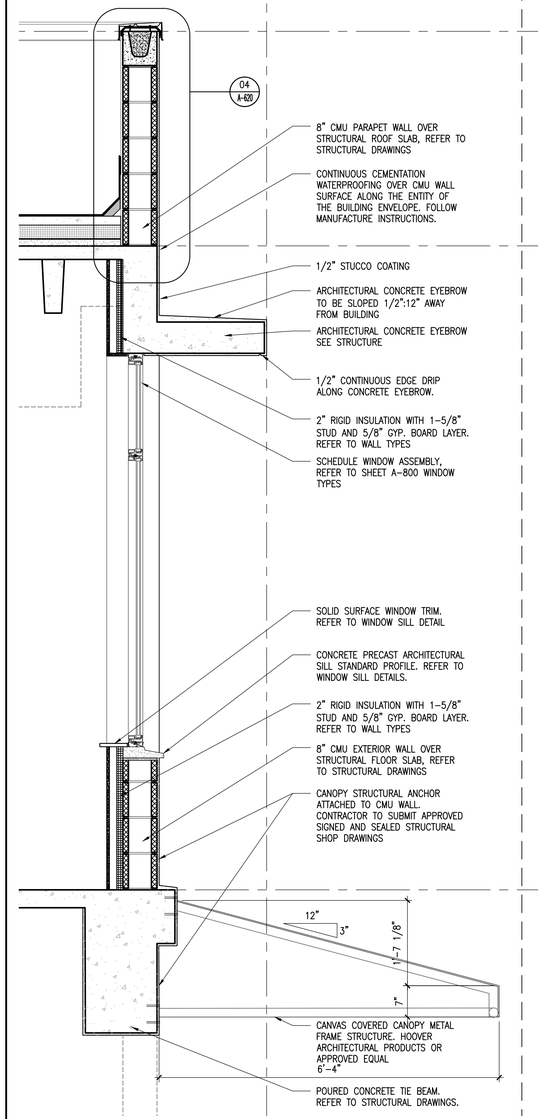
WALL SECTION 02

– – 3/4" = 1'–0"



WALL SECTION 03

– – 3/4" = 1'–0"



WALL SECTION 04

– – 3/4" = 1'–0"

宋

Song + Associates

Architecture ◆ Planning ◆ Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
STATE OF FLORIDA
AR98054

NAME: ROBERT M. CASTROVINCI

LICENSE#: AR98054

DATE: 01–05–2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01–05–2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

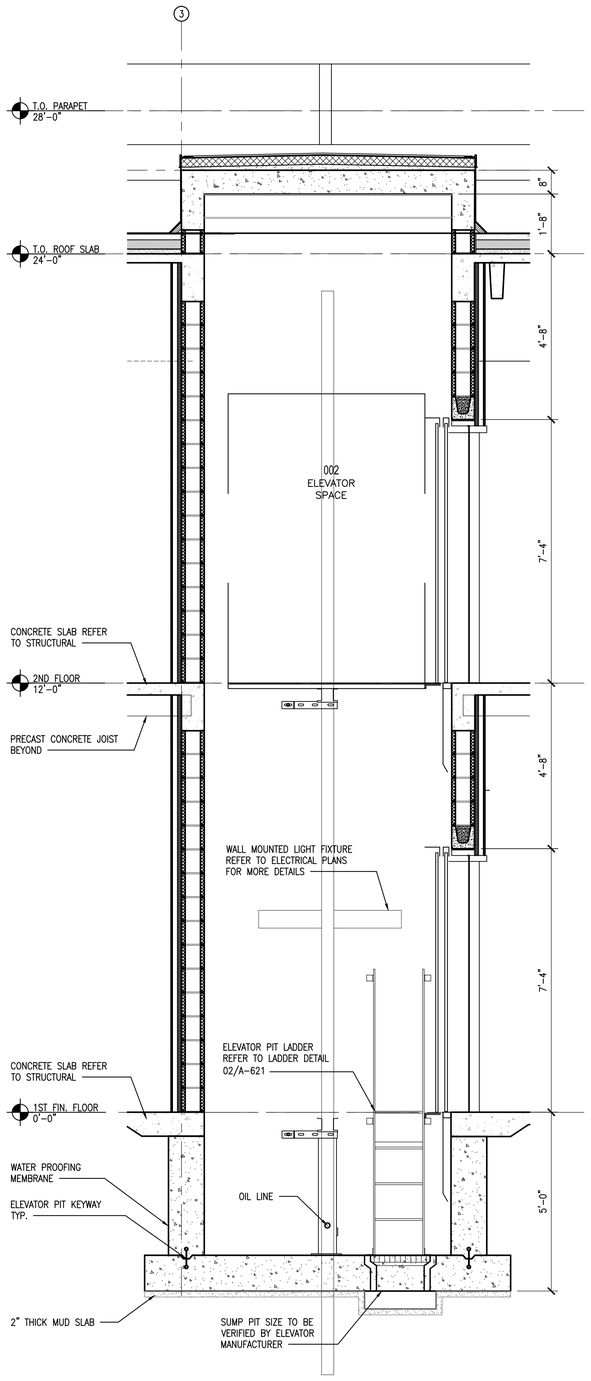
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

WALL SECTIONS

Sheet # :

A-601

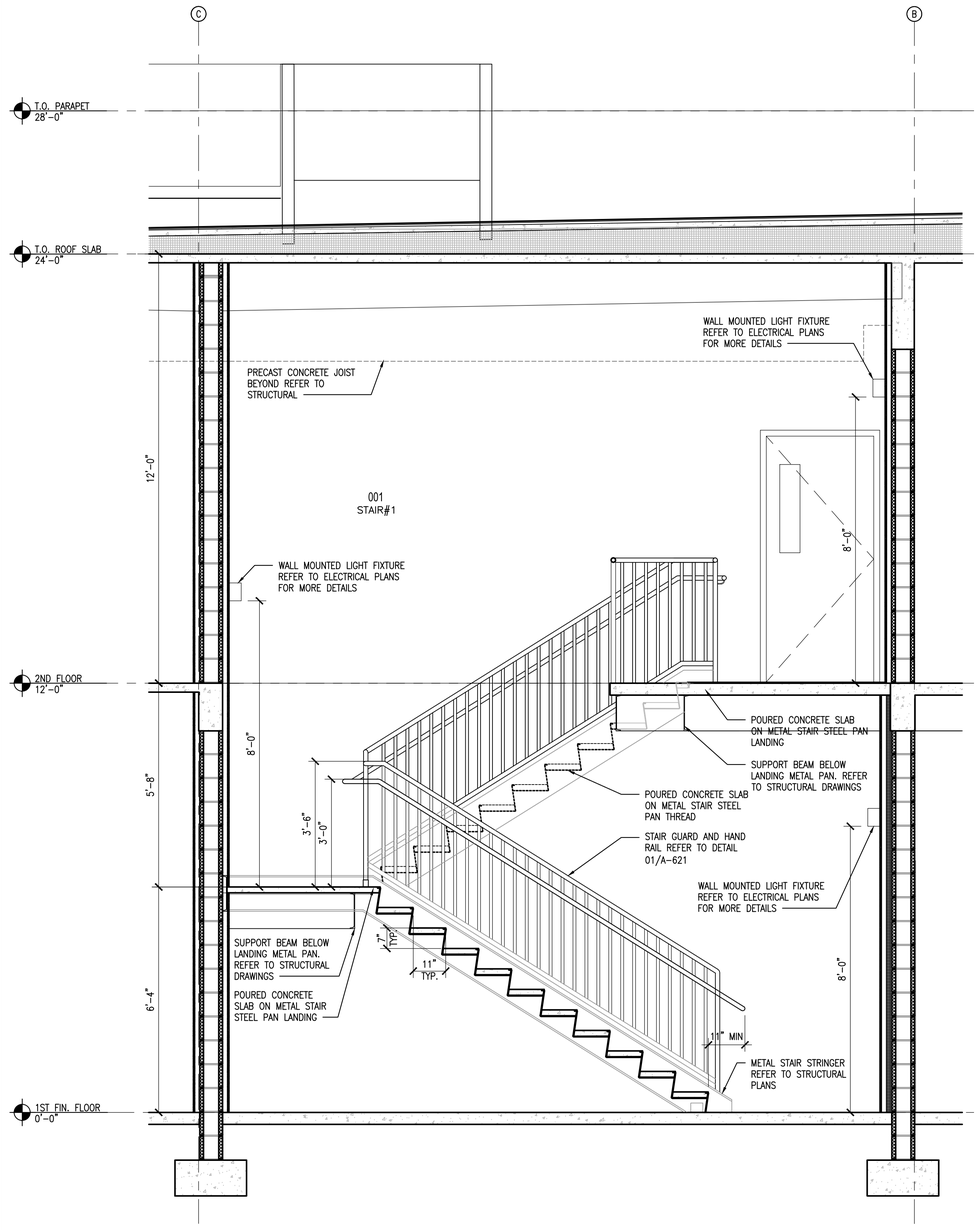


ENLARGED ELEVATOR SECTION

01

– –

1/2" = 1'-0"

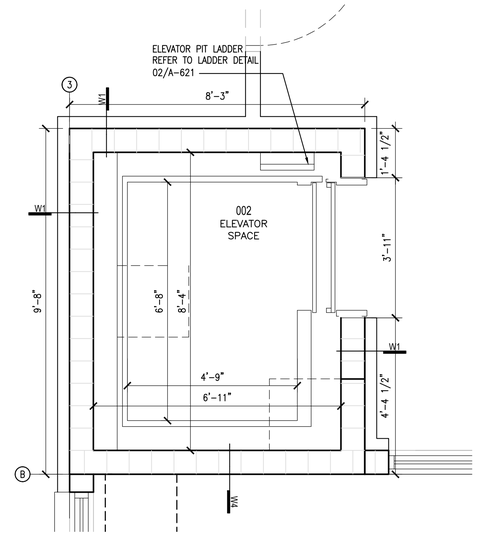


ENLARGED STAIR SECTION

02

– –

1/2" = 1'-0"

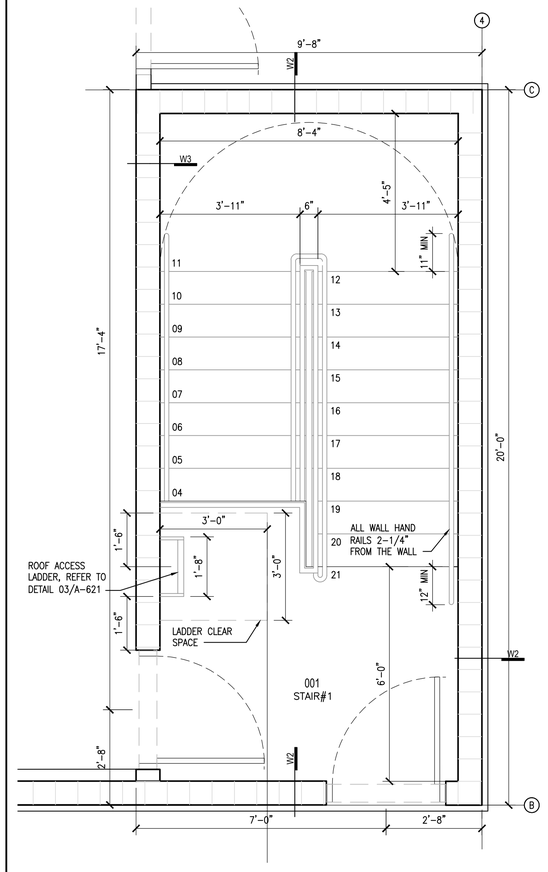


ENLARGED ELEVATOR FLOOR PLAN

03

SECOND FLOOR

1/2" = 1'-0"



ENLARGED STAIR FLOOR PLAN

04

SECOND FLOOR

1/2" = 1'-0"

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

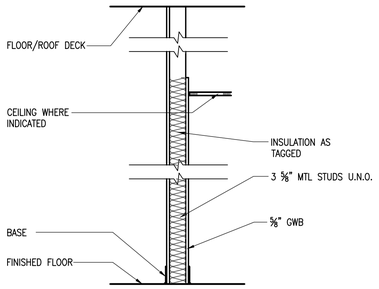
Phase :
100% CONSTRUCTION
DOCUMENTS

Sheet Title :

STAIR AND
ELEVATOR
SECTIONS

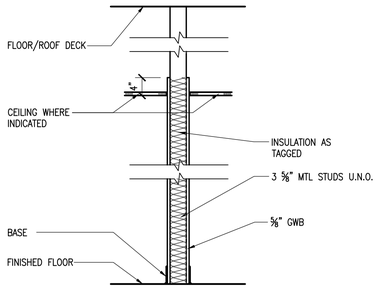
Sheet # :

A-620



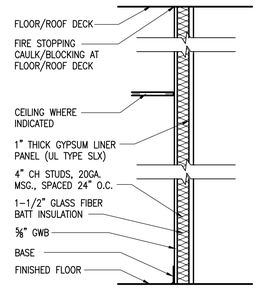
WALL TYPE P1

TYPICAL PARTITION TYPE — 3/4"=1'-0"



WALL TYPE P2

3/4"=1'-0"



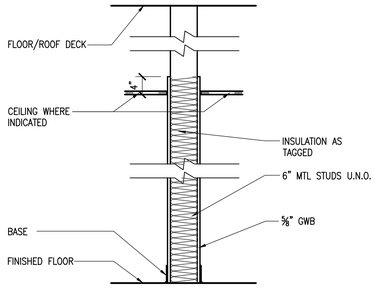
REFER TO DETAIL 25/A-802 FOR ACCESS PANEL DOOR ASSEMBLY

UL U415
SHAFT WALL - STEEL STUD (NON-LOAD-BEARING)

FIRE RATING 1 HOURS
SYSTEM STC N/A
SYSTEM THICKNESS 4 5/8 IN.

WALL TYPE P3

3/4"=1'-0"



WALL TYPE P4

TYPICAL PARTITION TYPE — 3/4"=1'-0"

GENERAL WALL NOTES :

1. THESE WALL & PARTITION TYPES ARE DIAGRAMMATIC IN NATURE REFER TO BUILDING SECTIONS, FINISH SCHEDULE AND FIRE RESISTIVE DESIGNS FOR ADDITIONAL INFORMATION.

2. WALL TAG DESIGNATION IS INTENDED TO INDICATE WALL TYPE ALONG AN ENTIRE WALL PLANE AND/OR SURFACE ALONG THE FULL LENGTH OF A SPACE OR CORRIDOR INCLUDING ASSOCIATED ALCOVES AND NICHES, UNLESS INDICATED OTHERWISE.
WALL TYPES ON A-650 AND A-651 REFER TO INTERIOR PARTITIONS ONLY.

3. REFER TO LIFE SAFETY PLANS FOR LOCATION AND FULL EXTENT OF FIRE AND SMOKE RATED ASSEMBLIES. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL WALL RATINGS.

4. AT UNRATED ASSEMBLIES, WALL BOARD ASSEMBLY SHALL EXTEND TO DECK ABOVE & BE SEALED TO LIMIT PASSAGE OF SMOKE UNLESS PARTITION TYPE INDICATES OTHERWISE. FINISH SHALL EXTEND TO 4" ABOVE CEILING UNLESS OTHERWISE REQUIRED.

5. REFER TO FINISH SCHEDULE FOR TYPE OF WALL FINISH TO BE UTILIZED AT EACH LOCATION. CONTACT ARCHITECT WHERE PARTITION TYPES CONFLICT WITH SCHEDULES

6. IF A CEILING IS NOT REQUIRED IN A SPACE, CONTRACTOR SHALL CONTINUE WALL AND FINISH TO DECK ABOVE.

7. INTERIOR STUD DOOR HEAD & JAMB FRAMING TO BE 20 GAUGE STUDS, TYP. PROVIDE 20 GAUGE STUDS AT INTERIOR WALLS RECEIVING TILE FINISH.

8. MAXIMUM STUD SPACING & MIN. STUD GAUGE SHALL PROVIDE A MAXIMUM DEFLECTION OF L/240 UNDER A MINIMUM 5 PSF LATERAL LOAD, UNLESS OTHERWISE INDICATED. PROVIDE FRAMING W/ 20 GA. STUDS @ 16" O.C. UNLESS HEAVIER GA. OR CLOSER SPACING IS REQUIRED TO PROVIDE A MIN. OF L/240 MAX. LATERAL DEFLECTION. DOUBLE STUDS AT ALL INTERIOR DOORS.

9. SET ALL FLOOR TRACKS IN TWO CONTINUOUS BEADS OF ACOUSTICAL (NON-HARDENING). IN ADDITION, PROVIDE A CONTINUOUS BEAD OF ACOUSTICAL CAULK BETWEEN THE BOTTOM OF DRYWALL AND CONCRETE SLAB

10. ALL GWB SHALL CONTAIN MOLD/MILDEW RESISTIVE PROPERTIES, AT RESTROOM LOCATION

11. ALL PARTITIONS TO BE ATTACHED AT THE TOP AND BOTTOM OF THE PLATES WITH FASTENERS SPACED AT 24" ON CENTER MAX.

12. ALL PARTITIONS WHERE DRYWALL DOES NOT EXTEND TO THE DECK ABOVE THE CEILING ON BOTH SIDES OF THE PARTITION, WILL REQUIRE DRAFTSTOPS AT THE CEILING LINES.

13. AT FIRST FLOOR OF EXTERIOR MASONRY WALLS, INTERIOR GWB FINISH TO HAVE A GAP OF ONE INCH FROM FLOOR.

RATED WALL NOTES :

1. ALL RATED STEEL STUD PARTITION WALLS, JOINTS, PENETRATIONS AND WALL EXTENSIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH UL, GA, W-H, OR FM DESIGN NUMBERS.

2. ALL PENETRATIONS OF RATED STEEL STUD PARTITION WALLS AND WALL EXTENSIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SYSTEMS INDICATED ABOVE.

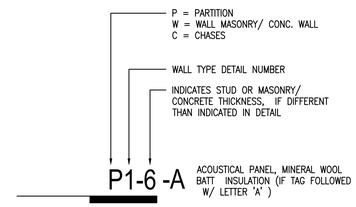
3. ALL RATED CONC. AND/OR MASONRY WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FBC SECTION 721 U.N.O.

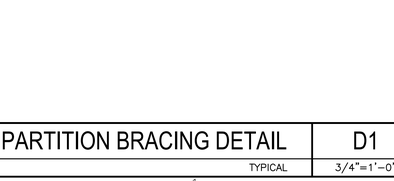
4. ALL PENETRATIONS OF RATED MASONRY WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SYSTEMS INDICATED ABOVE.

5. ALL ALTERNATE PENETRATION, JOINTS, HEAD OF WALLS, AND PROTECTION SYSTEMS MUST BE TEST CERTIFIED AND SUBMITTED FOR REVIEW AND APPROVAL.

6. ALL PENETRATIONS OF RATED FLOOR/CEILING ASSEMBLIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH SYSTEMS INDICATED.

WALL TYPE SYMBOL LEGEND





WALL TYPE W1

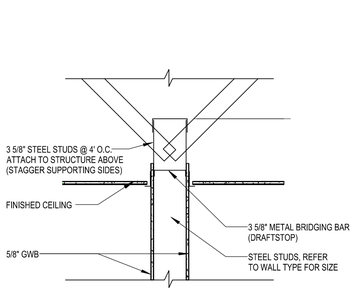
3/4"=1'-0"

WALL TYPE W2

3/4"=1'-0"

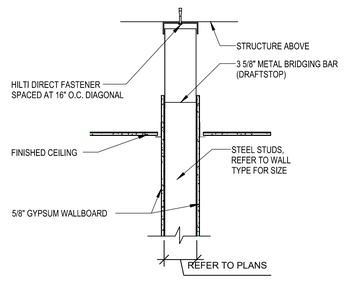
WALL TYPE W3

3/4"=1'-0"



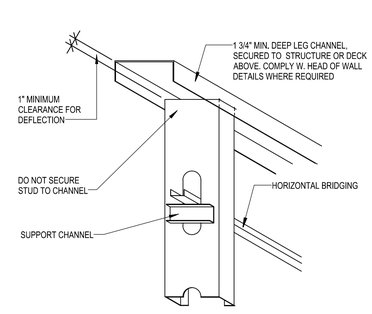
PARTITION BRACING DETAIL D1

TYPICAL — 3/4"=1'-0"



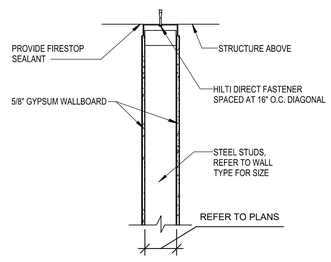
DEFLECTION TRACK DETAIL D2

TYPICAL — 3/4"=1'-0"



DEFLECTION TRACK DETAIL D3

TYPICAL — 3/4"=1'-0"



DEFLECTION TRACK DTL D4

TYPICAL — 3/4"=1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — STATE OF FLORIDA — AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

WALL AND PARTITION TYPES

Sheet # :

A-650

DOOR SCHEDULE

DOOR	DOOR INFO			FRAMES INFO			DETAILS			FIRE RATING	HW GROUP	CARD READER	KEY PAD	REMARK
	SIZE	MAT	TYPE	SIZE	MAT	TYPE	HEAD	JAMB	TRHOLD.					
001A	3070	HM	NG	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	05	NO	NO	A,E
001B	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	03	NO	NO	A,E,I,J
100A	3070	AL	FG	4-1/2"	AL	F1	05/A801	06/A801	07/A801	N/A	02	NO	NO	E,I,J,K
100B	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	03	NO	NO	E,J,J
101A	3070PR	AL	FG	4-1/2"	A	F2	05/A801	06/A801	07/A801	N/A	01	NO	NO	E,I,J,K
101B	3070	HM	FG	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	06	NO	NO	E
102	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	03/A801	N/A	07	NO	NO	E
103	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	03/A801	N/A	07	NO	NO	E
104	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	06	NO	NO	E
105	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	06	NO	NO	E
106	3070	HM	M	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	06	NO	NO	E,D,G
107	3070	HM	M	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	04	NO	NO	E,G,I,J

FIRST FLOOR DOOR SCHEDULE — 01

– – NA

DOOR	DOOR INFO			FRAMES INFO			DETAILS			FIRE RATING	HW GROUP	CARD READER	KEY PAD	REMARK
	SIZE	MAT	TYPE	SIZE	MAT	TYPE	HEAD	JAMB	TRHOLD.					
001C	3070	HM	NG	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	05	NO	NO	A,E
001D	3070	HM	NG	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	05	NO	NO	A,E
201	3070	HM	FG	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	06	NO	NO	E
202	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	03/A801	N/A	07	NO	NO	E
203	3070	HM	F	5-3/4"	HM	F1	01/A801	02/A801	03/A801	N/A	07	NO	NO	E
204	3070	HM	M	5-3/4"	HM	F1	01/A801	02/A801	04/A801	N/A	06	NO	NO	D,G
205	3070	HM	FG	5-3/4"	HM	F1	01/A801	02/A801	15/A801	N/A	06	NO	NO	E

SECOND FLOOR DOOR SCHEDULE — 02

– – NA

GENERAL NOTES

NOTE: DOOR SIZE DESIGNATION:
3870 = 3'-8" WIDE X 7'-0" HIGH DOOR LEAF SIZE
30810 = 3'-0" WIDE X 8'-10" HIGH DOOR LEAF SIZE
NOTE: FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

EXTERIOR GLAZING: BASIS OF DESIGN 9/16"
LAMINATED IMPACT RATED GLASS
COLOR: PPG ATLANTICA
COATING; LOW-E PERFORMANCE
SHADING COEFFICIENT: 0.64 OR BETTER
U-VALUE : 1.0 OR BETTER.

REMARKS:

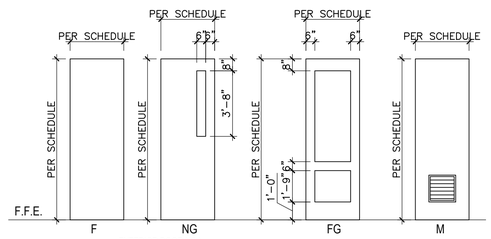
A. PROVIDE PANIC HARDWARE
B. PROVIDE DELAYED EGRESS
C. PROVIDE KEYED REMOVABLE CENTER MULLION.
D. DOOR SHALL COMPLY WITH STC RATING AND PROVIDE FULL PERIMETER SOUND SEALS AND DOOR BOTTOM.
E. DOOR SHALL BE SELF CLOSING.
F. *OPENING WIDTH AND HEIGHT
G. 18X18 GRILLE AT DOOR
H. TRANSOM OVER DOOR, REFER TO W13 EXTERIOR WINDOW TYPES 02/A-801
I. HIGH SPEED/PERFORMANCE HURRICANE ZONE DOOR
J. BITUMINOUS COATING AT EXTERIOR METAL FRAMES
K. STORE FRONT ASSEMBLY

WINDOW TYPE LEGEND

F	FIXED
OP	OPPOSITE
SIM	SIMILAR

GLASS TYPE LEGEND

01 TEMPERED GLASS
02 IMPACT/TINTED GLASS
03 IMPACT/SPANDREL GLASS



ALL PRODUCT APPROVALS FOR ROOFING, WINDOWS, EXTERIOR DOORS, ROOF HATCH, AND LOUVERS ARE BEING DEFERRED TO THE CONTRACTOR IN THE SHOP DRAWING SUBMITTAL PHASE.

DOOR TYPES

EXTERIOR DOOR NOA:
NOA 20-1005.18 - SINGLE DOOR
NOA 20-1005.19 - DOUBLE DOOR
NOA 20-0424.01 - STORE FRONT DOORS

DOOR TYPES — 03

– – 1/4"=1'-0"

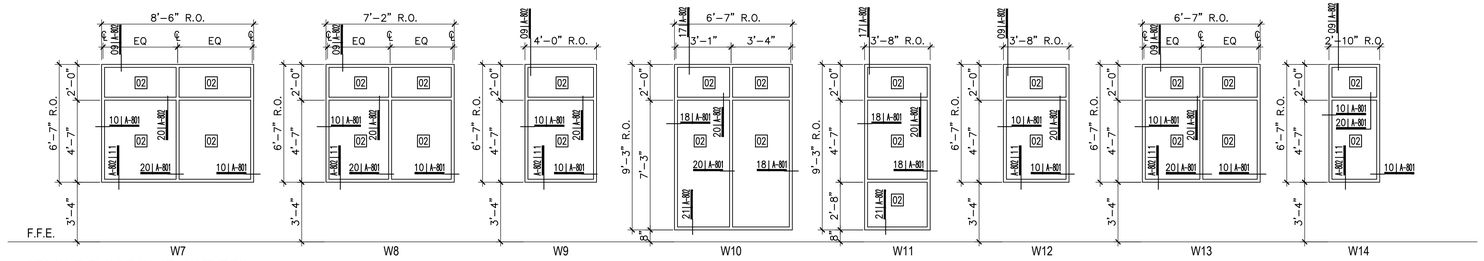
DOOR FRAMES

DOOR FRAME TYPES — 04

– – 1/4"=1'-0"

LOUVER TYPES — 05

– – 1/4"=1'-0"



SECOND FLOOR WINDOW TYPES

NOTE: JAMB TAG ALSO APPLIES TO OPPOSITE JAMB IN OPPOSITE CONDITION

ALL PRODUCT APPROVALS FOR ROOFING, WINDOWS, EXTERIOR DOORS, ROOF HATCH, AND LOUVERS ARE BEING DEFERRED TO THE CONTRACTOR IN THE SHOP DRAWING SUBMITTAL PHASE.

FIRST FLOOR WINDOW TYPES NOA 21-0122.14

WINDOW TYPES — 06

NOA 21-0122.14 1/4"=1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — STATE OF FLORIDA — AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc., whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

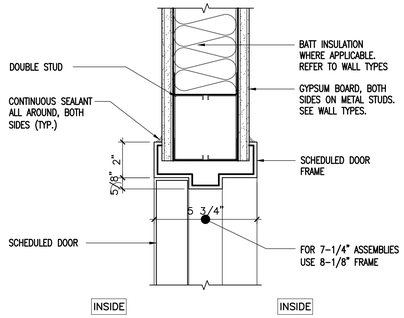
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

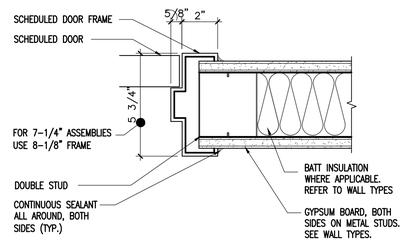
Sheet Title :
DOORS & WINDOWS SCHEDULE AND TYPE

Sheet # :
A-800



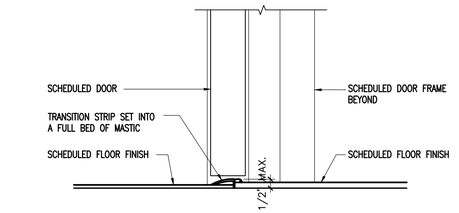
DOOR HEAD DETAIL — 01

3"=1'-0"



DOOR JAMB DETAIL — 02

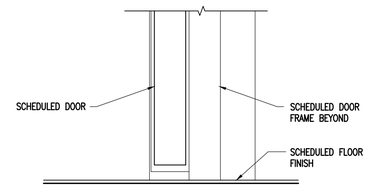
3"=1'-0"



NOTE: UNDERCUT DOORS AT SADDLES

THRESHOLD DETAIL — 03

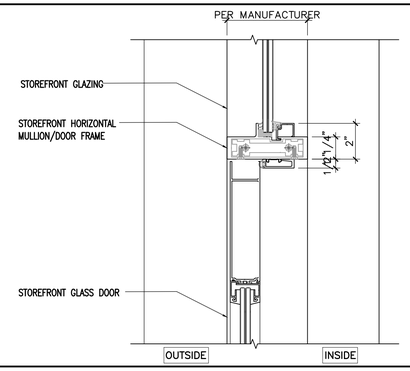
3"=1'-0"



NOTE: WHERE CARPET MEETS CARPET, FLOORING CONTRACTOR TO HEAT WELD UNDERSIDE OF CARPET FOR A CONTINUOUS TRANSITION

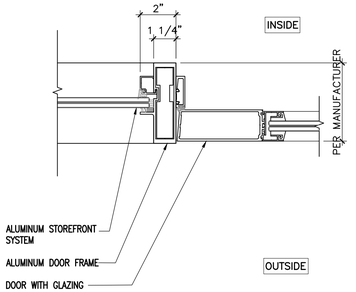
THRESHOLD DETAIL — 04

3"=1'-0"



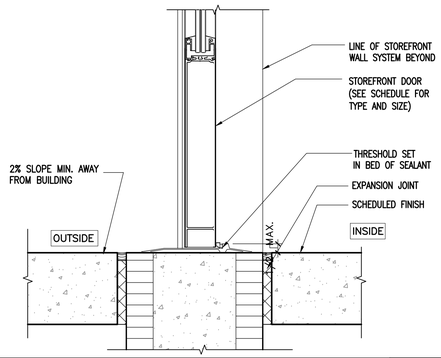
DOOR HEAD / SILL TRANSOM DETAIL — 05

3"=1'-0"



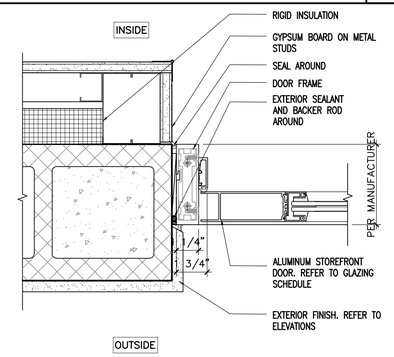
STOREFRONT DOOR JAMB DETAIL — 06

3"=1'-0"



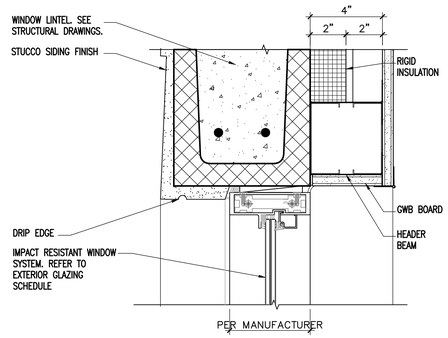
STOREFRONT DOOR THRESHOLD DETAIL — 07

3"=1'-0"



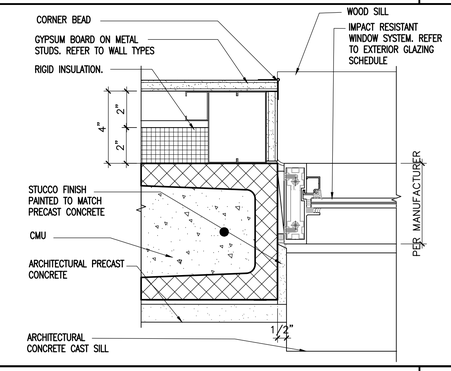
DOOR JAMB DETAIL — 08

3"=1'-0"



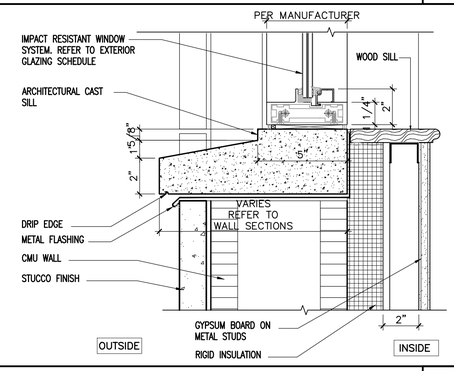
TRANSOM WINDOW HEAD DETAIL — 09

3"=1'-0"



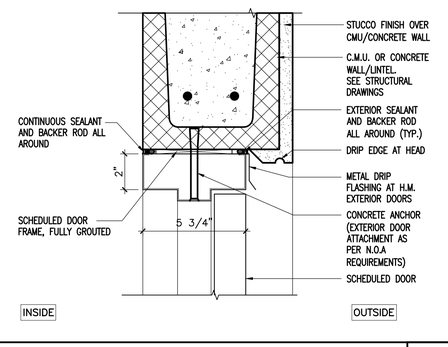
WINDOW JAMB DETAIL — 10

3"=1'-0"



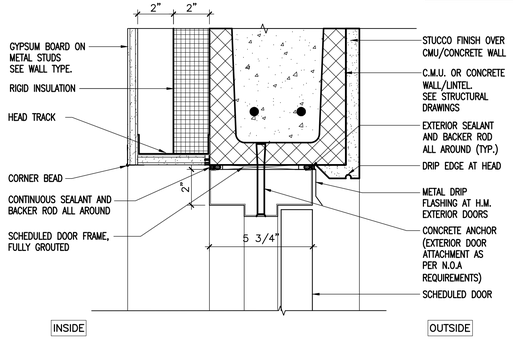
WINDOW SILL DETAIL — 11

3"=1'-0"



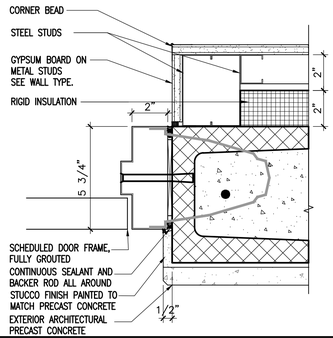
DOOR HEAD DETAIL — 12

3"=1'-0"



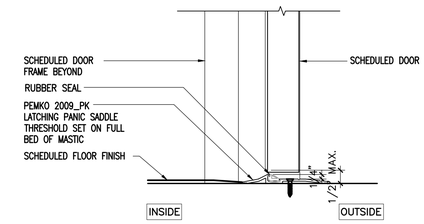
DOOR HEAD DETAIL — 13

3"=1'-0"



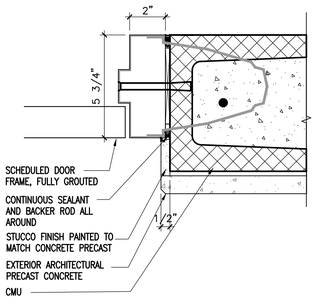
DOOR JAMB DETAIL — 14

3"=1'-0"



THRESHOLD DETAIL — 15

3"=1'-0"



DOOR JAMB DETAIL — 16

3"=1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI — STATE OF FLORIDA — AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

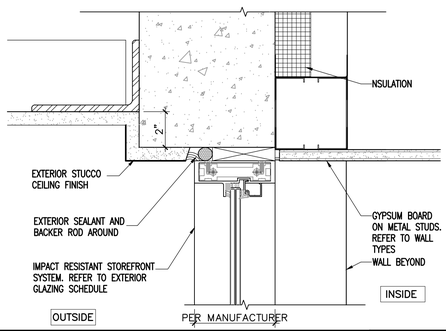
Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

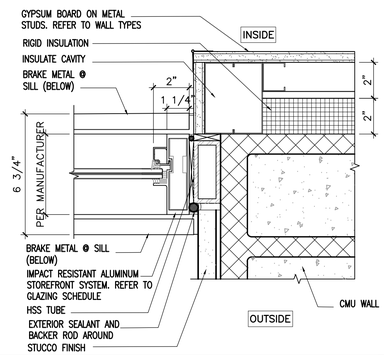
Sheet Title :
DOOR & WINDOW DETAILS

Sheet # :
A-801



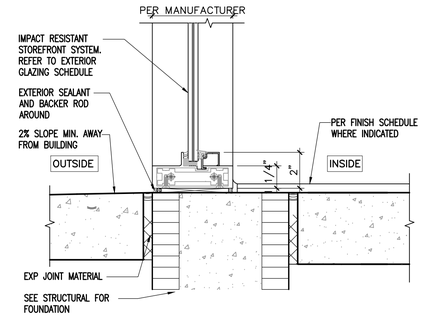
STOREFRONT HEAD DETAIL — 17

3"=1'-0"



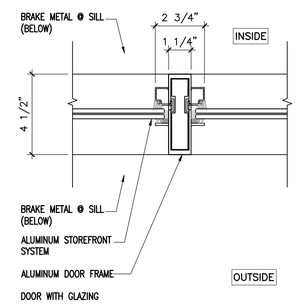
STOREFRONT JAMB DETAIL — 18

3"=1'-0"



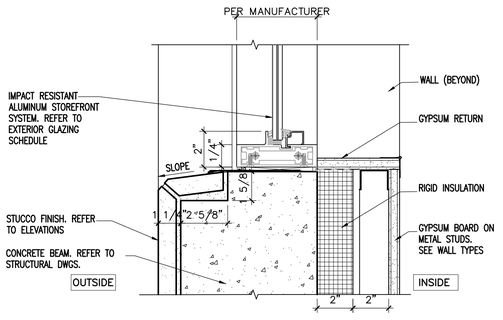
STOREFRONT SILL DETAIL — 19

3"=1'-0"



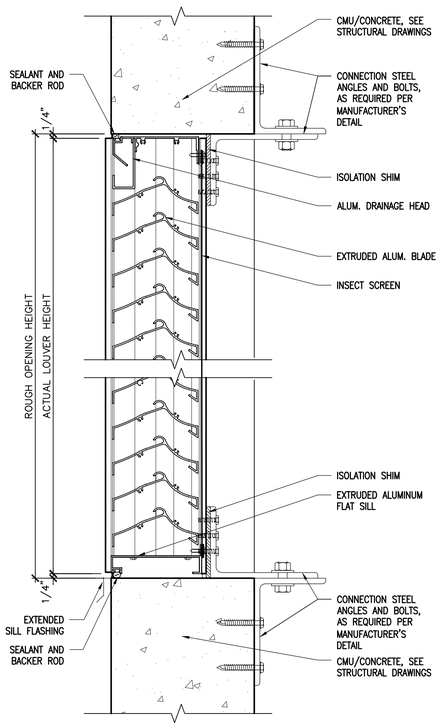
STOREFRONT MULLION DETAIL — 20

3"=1'-0"



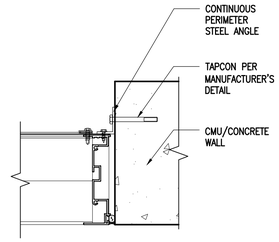
STOREFRONT SILL DETAIL @ 2ND FL — 21

3"=1'-0"



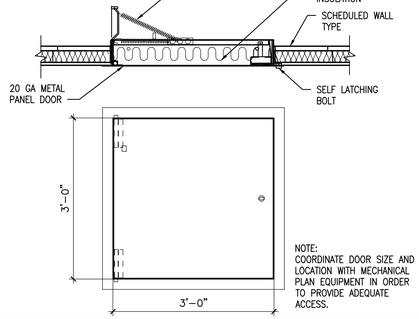
LOUVER HEAD/SILL DETAIL — 26

3"=1'-0"



LOUVER JAMB DETAIL — 27

3"=1'-0"



FIRE RATED ACCESS DOOR DETAIL — 25

3"=1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
STATE OF FLORIDA
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

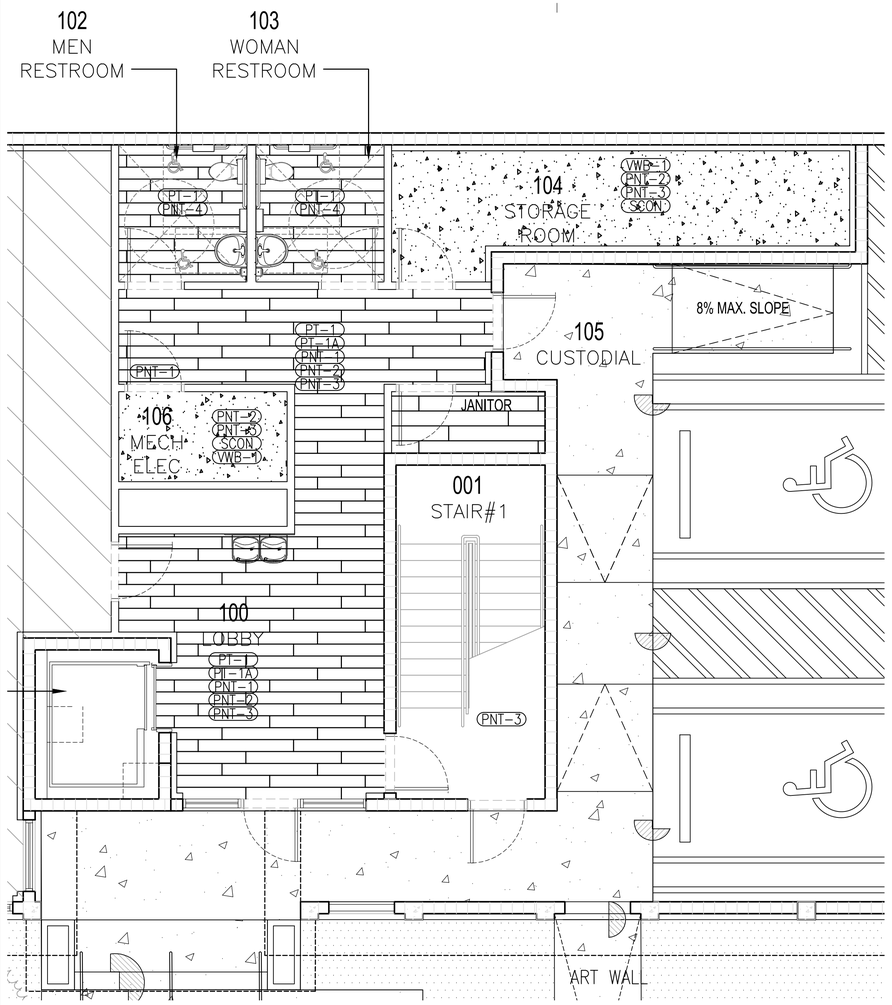
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

DOOR & WINDOW DETAILS

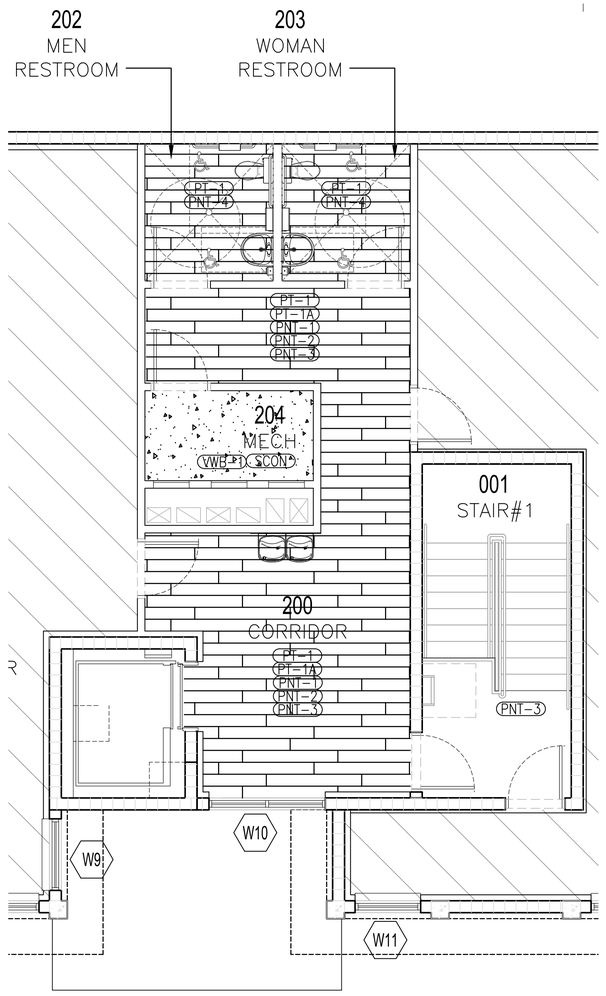
Sheet # :

A-802



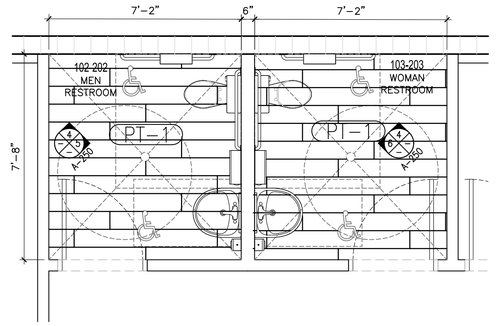
FIRST FLOOR PLAN — 01

1/4" = 0'-0"



SECOND FLOOR PLAN — 02

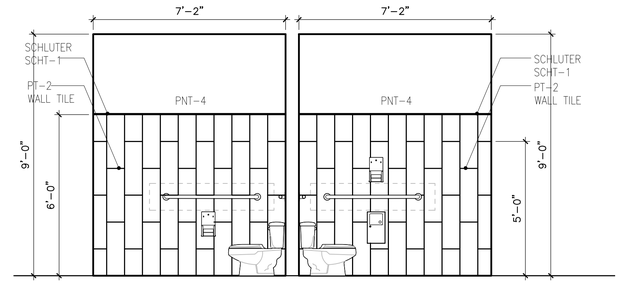
1/4" = 0'-0"



TYP. RESTROOM — 03

FIRST AND SECOND FLOOR

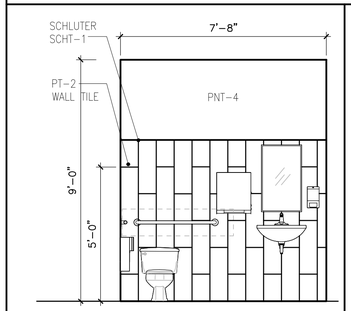
3/8" = 1'-0"

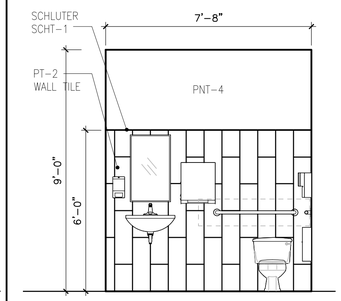


RESTROOM ELEVATION — 04

FIRST AND SECOND FLOOR

3/8" = 1'-0"





RESTROOM ELE. — 05

FIRST AND SECOND FLOOR

3/8" = 1'-0"

RESTROOM ELE. — 06

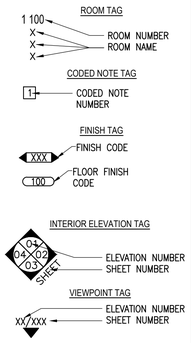
FIRST AND SECOND FLOOR

3/8" = 1'-0"

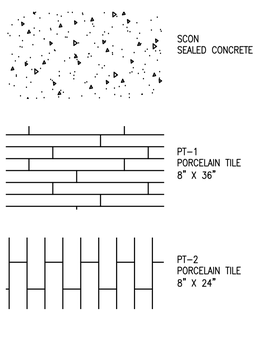
MATERIAL LEGEND

ACT	Acoustic Ceiling Tile
CPT	Carpet Tile
CSV	Coral Stone Veneer
EPX	Epoxy Flooring
ESD	Static Control Flooring
SCON	Sealed Concrete (no stain)
SCHT	Schluter Trim
SS	Solid Surface Material
PL	Plastic Laminate
LC	Light Cove
LVT	Levelset Resilient "wood" plank flooring
MCT	Marmoleum Composition Flooring
PCS	Precast Stone
PT	Porcelain Tile
PNT	Paint
TS	Transition Strip
TP	Toilet Partitions
RT	Rubber Tile Flooring
RUB	Rubber Wall Base
WT	Wood Trim
WD	Wood Door and Veneer Finish
WP	Wall Protection
SWS	Sheerweave Shades

FINISH TAG LEGEND



FINISH LEGEND



FINISH SPECIFICATIONS

CODE	MATERIAL	TAG	SPECIFICATION
PT	PORCELAIN TILE	PT-1	D&B TILE / CROSSVILLE – NEST (CORRIDOR / LOBBY TILE) COLOR: AV363 BLISSFUL OLIVE | SIZE: 8" x 36" REP: MAITIA ALVAREZ–D&B TILE / 754.228.7259
		PT-1A	D&B TILE / CROSSVILLE– NEST (LOBBY WALL BASE TILE) COLOR: AV363 BLISSFUL OLIVE | SIZE: 6"X36" REP: MAITIA ALVAREZ–D&B TILE / 754.228.7259
		PT-2	D&B TILE / AMERICAN OLEAN PRODUCT: COLOR STORY COLLECTION | SIZE: 8"X24" COLOR: 0025 ICE WHITE WALL TILE/INTERIOR RESTROOMS REP: MAITIA ALVAREZ–D&B TILE / 754.228.7259
PNT	PAINT	PNT-1	SHERWIN WMS: FOR METAL DOOR FRAMES/ANY METAL DOORS – LOW LUSTER ENAMEL; COLOR: SW7003 TOQUE WHITE
		PNT-2	SHERWIN WMS: CEILING COLOR/FLAT FINISH COLOR: SW7003 TOQUE WHITE
		PNT-3	SHERWIN WMS: GENERAL WALL COLOR/SEMI-GLOSS FINISH COLOR: SW7003 TOQUE WHITE
		PNT-4	SHERWIN WMS: RESTROOM WALLS COLOR/EPOXY FINISH COLOR: SW7003 TOQUE WHITE
VWB	VINYL WALL BASE	VWB-1	JOHNSONITE/TARKET PRODUCT: RECESS RWDC–CB 4–1/4" WALL BASE COLOR: 121 CEMENT
SCH	SCHLUTER TRIM	SCHT-1	SCHLUTER – FINISHING EDGE PROTECTION PROFILE PRODUCT: SCHIENE OR JOLLY – ALUMINUM, BRASS

GENERAL NOTES

1. ALL CHANGES OF PAINT COLORS SHALL START AND STOP AT INSIDE CORNERS. INTERIOR SURFACES TO BE PAINTED WITH TWO TOP COATS AND ONE COAT PRIMER.
2. SHERWIN WILLIAMS PROMAR ZERO VOC PRIMER IS (BASIS OF DESIGN OR APPROVED EQUAL) TO BE USED FOR INTERIOR SOFFITS, CEILINGS.
3. SHERWIN WILLIAMS PROMAR 200 ZERO VOC PRIMER IS (BASIS OF DESIGN OR APPROVED EQUAL) TO BE USED FOR INTERIOR WALLS.
4. SHERWIN WILLIAMS LOXON CONCRETE & MASONRY PRIMER IS (BASIS OF DESIGN OR APPROVED EQUAL) TO BE USED FOR EXTERIOR WALLS.
5. PROVIDE ADA–COMPLIANT TRANSITION STRIPS/SADDLES WHEREVER FLOORING MATERIAL CHANGES OCCUR, INCLUDING EXISTING FLOORING TRANSITION TO CONCRETE. SUBMIT PROPOSED MATERIALS TO ARCHITECT FOR APPROVAL PRIOR TO ORDERING.
6. TRANSITION STRIP TO BE CENTERED BETWEEN DOOR STOP(S).

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ROBERT M. CASTROVINCI
AR98054

NAME: ROBERT M. CASTROVINCI
LICENSE#: AR98054
DATE: 01-05-2022

CONSULTANTS:

COPYRIGHT ©2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : SV
Checked By : RC

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

INTERIOR
FINISH PLANS

Sheet # :

ID-211

CONTROL SEQUENCES:

CONTRACTOR SHALL PROVIDE PROGRAMMABLE THERMOSTAT WITH NIGHT-SETBACK AND HUMIDITY OVERRIDE FEATURES.

UNOCCUPIED MODE:
WHEN THE UNIT IS INDEXED FOR UNOCCUPIED OPERATION:
1. THE OUTSIDE AIR MOTORIZED VOLUME DAMPER IS CLOSED.
2. THE SUPPLY FAN AND ASSOCIATED COMPRESSOR(S) SHALL OPERATE TO MAINTAIN NIGHT SET-BACK SPACE TEMPERATURE SETPOINT (80 °F ADJ).
3. THE HEATER IS OFF.

OCCUPIED MODE:
WHEN THE UNIT IS INDEXED FOR OCCUPIED OPERATION:
1. THE OUTSIDE AIR MOTORIZED VOLUME DAMPER IS OPENED.
2. THE SUPPLY FAN SHALL BE STARTED.
3. THE ASSOCIATED COMPRESSOR(S) SHALL BE ENERGIZED WHEN SUPPLY FAN IS STARTED.

SPACE TEMPERATURE CONTROL:

COOLING MODE: COMPRESSOR(S) SHALL OPERATE TO MAINTAIN SPACE TEMPERATURE UPON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT (75 ° F ADJ).

HEATING MODE: THE HEATER SHALL OPERATE TO MAINTAIN THE SPACE TEMPERATURE SETPOINT (68 ° F ADJ).

HUMIDITY OVERRIDE:
UPON A RISE IN SPACE HUMIDITY LEVEL ABOVE THE SETPOINT (50% RH ADJ.) THE COMPRESSOR(S) SHALL BE ENERGIZED TO PROVIDE MAXIMUM MOISTURE REMOVAL.

SAFETIES:
PROVIDE ALL OPERATIONAL SAFETY SENSORS AND DEVICES AS RECOMMENDED BY MANUFACTURER TO SHUT EQUIPMENT DOWN UNDER COMPONENT FAILURE.

COORDINATE ANY WALL MOUNTED CONTROL DEVICES (INCLUDING FACEPLATE COVERS) WITH ARCHITECT / ENGINEER / OWNER PRIOR TO ORDERING.

TEST AND BALANCE SCOPE:

1. THE GENERAL CONTRACTOR / CONSTRUCTION MANAGER SHALL PROVIDE INDEPENDENT THIRD PARTY TEST AND BALANCE SERVICES.
2. THE ASSOCIATED SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COORDINATION AND SUPPORT REQUIRED FOR ALL TEST AND BALANCE PROCEDURES AND ACTIVITIES.
3. ALL DEFICIENCIES OR ADJUSTMENTS NOTED AS REQUIRING CORRECTION BY THE THIRD PARTY TEST AND BALANCE CONTRACTOR SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST WITHIN FIVE CALENDAR DAYS OF NOTIFICATION.
4. REFER TO SPECIFICATIONS FOR PRELIMINARY AND FINAL PERFORMANCE VERIFICATION REQUIREMENTS.
5. A TEST AND BALANCE SHALL BE PERFORMED ON ANY SYSTEMS TO REMAIN THAT ARE UNDERGOING RENOVATION. THE EXISTING SYSTEM PERFORMANCE SHALL BE CONFIRMED PRIOR TO THE START OF THE RENOVATION. ANY SYSTEM OR PERFORMANCE DEFICIENCIES NOTED SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR DIRECTION ON HOW TO PROCEED.

GENERAL NOTES:

1. ALL MECHANICAL WORK SHALL BE GOVERNED AND INSTALLED IN COMPLIANCE WITH THE LATEST EDITION AND APPLICABLE PROVISIONS OF THE FOLLOWING CODES AND STANDARDS:
   A. STATE REQUIREMENTS FOR EDUCATIONAL FACILITIES -SEC 453 OF FBC 2020.
   B. FLORIDA BUILDING CODE – 2020.
   C. FLORIDA MECHANICAL CODE – 2020.
   D. FLORIDA PLUMBING CODE – 2020.
   E. FLORIDA ENERGY EFFICIENCY CODE – 2020.
   F. FLORIDA FIRE PREVENTION 7TH EDITION.
   G. FLORIDA EXISTING BUILDING CODE – 2020.
   H. NFPA 90A – INSTALLATION OF AIR CONDITIONING & VENTILATING SYSTEMS .
   I. NFPA 101 – LIFE SAFETY CODE .
   J. ASHRAE STANDARDS (INCLUDING 15, 55, 62.1, 90.1 & 129) .
   K. ANSI
   L. SMACNA DUCTWORK STANDARDS.
   M. AMERICANS WITH DISABILITIES ACT (ADA).
   N. ALL OTHER APPLICABLE FEDERAL, COUNTY AND CITY CODES REQUIRED BY LOCAL JURISDICTIONS.
2. THE CONTRACTOR SHALL READ THE SPECIFICATIONS. THE SPECIFICATIONS AND DRAWINGS TOGETHER DEFINE THE FULL CONTRACT REQUIREMENTS. IN THE EVENT OF A DISCREPANCY BETWEEN THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT APPLIES UNLESS DIRECTION HAS BEEN PROVIDED THROUGH A FORMAL REQUEST FOR INFORMATION OR CLARIFICATION PRIOR TO THE CLOSE OF THE BIDDING.
3. ANY PROPOSED EQUIPMENT OR MATERIAL SUBSTITUTIONS SHALL BE APPROVED BY THE OWNER AND ENGINEER OF RECORD PRIOR TO THE CLOSE OF BIDDING. NO EQUIPMENT OR MATERIAL SUBSTITUTIONS WILL BE CONSIDERED ONCE THE BIDDING HAS ENDED AND THE GMP HAS BEEN ESTABLISHED.
4. AIR HANDLING SYSTEMS SHALL NOT BE ENERGIZED UNTIL ALL OF THE DRYWALL FINISHING AND PAINTING SCOPES HAVE BEEN COMPLETED. CONFIRMATION THAT THOSE SCOPES ARE REQUIRED WITH WRITTEN APPROVAL FROM THE OWNER AND ENGINEER BEFORE AIR HANDLING UNIT AND FANS CAN BE ENERGIZED. FAILURE TO OBTAIN WRITTEN APPROVAL TO ENERGIZE THE FANS WILL RESULT IN THE CLEANING OF THE ENTIRE INTERIOR OF ANY AFFECTED AIR DISTRIBUTION SYSTEM BY A LICENSED THIRD-PARTY CONTRACTOR AT NO ADDITIONAL COST.
5. ALL TEMPORARY FILTRATION AT AIR HANDLING EQUIPMENT AND ANY RETURN AIR INTAKE GRILLE SHALL BE REPLACED A MINIMUM OF ONCE A MONTH DURING PERIODS OF OPERATION DURING CONSTRUCTION. A LOG MUST BE MAINTAINED AT EACH AIR HANDLING UNIT INDICATING DATES OF FILTER REPLACEMENTS FOR INSPECTION. FAILURE TO MAINTAIN THE REQUIRED LOGS WILL RESULT IN THE CLEANING OF THE ENTIRE INTERIOR OF ANY AFFECTED AIR DISTRIBUTION SYSTEM BY A LICENSED THIRD PARTY CONTRACTOR AT NO ADDITIONAL COST.
6. ALL EQUIPMENT, DUCTWORK AND MATERIALS STORED ON THE JOBSITE SHALL BE PROPERLY PROTECTED FROM THE ELEMENTS AND CONSTRUCTION DIRT AND DEBRIS. ANY MATERIAL EXPOSED TO THE ELEMENTS WITH EXPOSED INSULATION WILL BE REQUIRED TO BE REPLACED AT NO ADDITIONAL COST. ANY EQUIPMENT OR MATERIAL THAT IS EXPOSED TO THE ELEMENTS, DIRT AND DEBRIS THAT ARE DEEMED ACCEPTABLE TO REMAIN SHALL BE THOROUGHLY CLEANED AND DISINFECTED AND SIGNED OFF ON BY THE OWNER'S REPRESENTATIVE AND THE ENGINEER OF RECORD PRIOR TO INSTALLATION.
7. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL REQUIREMENTS WITH EQUIPMENT SUPPLIED.
8. ALL EQUIPMENT HOUSINGS AND COMPONENTS INSTALLED OUTDOORS OR WITHIN UNCONDITIONED VENTILATED SPACES THAT ARE EXPOSED TO THE ELEMENTS SHALL BE SUITABLE FOR SEACOAST APPLICATION. ANY APPLIED CORROSION RESISTANT MATERIALS SHALL BE FACTORY APPLIED.
9. EVERY PIECE OF MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE WITH MINIMUM 1" HIGH LETTERS INDICATING EQUIPMENT DESIGNATION. ANY EQUIPMENT INSTALLED WHERE CONCEALED ABOVE CEILINGS SHALL BE NOTED WITH CLEAR ADHESIVE LABEL AT NEAREST T-GRID OR ON ACCESS PANEL IN ADDITION TO THE ENGRAVED NAMEPLATE.
10. ALL VARIABLE FREQUENCY DRIVES AND MOTOR STARTERS SHALL BE PROVIDED WITH ENGRAVED LABELS INDICATING ASSOCIATED EQUIPMENT THEY SERVE AS WELL AS THE ELECTRICAL PANEL AND CIRCUIT THAT FEEDS THE DEVICE.
11. ALL EXTERIOR MECHANICAL EQUIPMENT AND THEIR FRAMES, APPURTENANCES, COMPONENTS, SUPPORTS AND ANCHORING DEVICES SHALL BE ANCHORED TO RESIST THE FORCES DUE TO WIND PRESSURE AS REQUIRED BY THE FLORIDA BUILDING CODE.
12. ALL EQUIPMENT AND MATERIALS INSTALLED THAT INTERFACE WITH THE ROOFING SYSTEM SHALL BE COORDINATED WITH THE ROOFING SYSTEM BEING PROVIDED. ALL MECHANICAL EQUIPMENT INSTALLATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE ROOFING MANUFACTURER TO MAINTAIN CONTINUITY AND WARRANTIES.
13. ALL LOW-PRESSURE SUPPLY, RETURN AND EXHAUST DUCTWORK ARE DESIGNED FROM A MINIMUM OF 0.05" TO A MAXIMUM OF 0.1" OF FRICTION PER 100 FT. OF DUCT.
14. DUCTWORK LAYOUTS INDICATED ON PLANS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO BE USED AS DUCT FABRICATION DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION EFFORTS BETWEEN TRADES AS OUTLINED IN THE SPECIFICATIONS.
15. ALL LOW-PRESSURE BRANCH DUCTS SHALL BE PROVIDED WITH A MANUAL VOLUME DAMPER FOR BALANCING. ALL MANUAL VOLUME DAMPERS SHALL BE PROVIDED WITH A MINIMUM 12" LENGTH OF FLUORESCENT ORANGE RIBBON TO AIDE IN VISIBILITY WHERE ABOVE CEILINGS.
16. ALL INSULATION / DUCT SEAMS SHALL BE SEALED WITH GLASS FAB, STAPLES AND MASTIC. PRESSURE SENSITIVE TAPE IS NOT AN APPROVED DUCT / INSULATION CLOSURE SYSTEM. ANY PRESSURE SENSITIVE TAPE USED WILL BE REQUIRED TO BE REMOVED AND REPLACED WITH A PROPER CLOSURE SYSTEM.
17. DUCT ACCESS DOORS SHALL BE PROVIDED WHERE ANY EQUIPMENT REQUIRING ACCESS IS INSTALLED ABOVE AN INACCESSIBLE CEILING. MINIMUM SIZE SHALL BE 12X12 OR AS LARGE AS NECESSARY TO ACCOMMODATE EQUIPMENT REPLACEMENT AND SERVICE.
18. ALL DUCT AND PIPING PENETRATIONS THROUGH TILT WALL PANELS SHALL BE COORDINATED BETWEEN THE TILT WALL AND MECHANICAL SUBCONTRACTORS PRIOR TO WALL PANEL FORMING OR DUCT FABRICATION.
19. ALL WALL SENSORS SHALL BE PROVIDED WITH ENGRAVED NAMEPLATE WITH 1/4" HIGH LETTERS INDICATING THE ASSOCIATED MECHANICAL EQUIPMENT IT SERVES.
20. ALL THREE PHASE MOTORS SHALL HAVE PHASE LOSS / ROTATION MONITORS.
21. PROVIDE MOTOR STARTERS FOR ALL MOTORS THAT ARE REQUIRED TO BE CONTROLLED THAT ARE NOT BEING PROVIDED WITH A VARIABLE FREQUENCY DRIVE.

ABBREVIATIONS

SYMBOL	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
AFMS	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT (VARIABLE)
ALT	ALTERNATE
AO	ANALOG OUTPUT (VARIABLE)
APPROX	APPROXIMATE
ARCH	ARCHITECT
AVG	AVERAGE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BHP	BREAK HORSEPOWER
BI	BINARY INPUT (ON-OFF)
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
BO	BINARY OUTPUT (ON-OFF)
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
℄	CENTERLINE
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CKT	CIRCUIT
CO	CLEANOUT
CONC	CONCENTRIC
CONT	CONTINUATION
CU FT	CUBIC FEET
CU IN	CUBIC INCH
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
EAT	ENTERING AIR TEMPERATURE
ECC	ECCENTRIC
ECO	EXTERIOR CLEANOUT
EDH	ELECTRIC DUCT HEATER
EFF	EFFICIENCY
EG	EXHAUST GRILLE
EL	EXHAUST LOUVER
ELEV	ELEVATION
EMS	ENERGY MANAGEMENT SYSTEM
ENT	ENTERING
EQUIP	EQUIPMENT
ERV	ENERGY RECOVERY WHEEL
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
F	FAHRENHEIT
F/SD	FIRE/SMOKE DAMPER
FA	FIRE ALARM
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
FDC	FLEXIBLE DUCT CONNECTION
FLEX	FLEXIBLE
FLR	FLOOR
FMCS	FMCS
FO	FLAT OVAL
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
H	HUMIDITY
HD	HEAD
HDG	HOT DIP GALVANIZED
HL	HIGH LIMIT
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HZ	HERTZ
ID	DIAMETER, INSIDE
IN	INCH
INSUL	INSULATION
INV	INVERT ELEVATION
IW	INDIRECT WASTE

ABBREVIATIONS - (CONT)

SYMBOL	DESCRIPTION
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT PER HOUR
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LL	LOW LIMIT
LR	LONG RADIUS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
M	METER
MAX	MAXIMUM
MBH	BTU PER HOUR, THOUSANDS
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFG	MANUFACTURER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MISC	MISCELLANEOUS
MOP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MVD	MOTORIZED VOLUME DAMPER
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NO	NUMBER
NO	NORMALLY OPEN
NPCW	NON POTABLE COLD WATER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAH	OUTSIDE AIR HOOD
OAI	OUTSIDE AIR INTAKE
OAL	OUTSIDE AIR LOUVER
OD	DIAMETER, OUTSIDE
ODP	OPEN DRIP PROOF
OZ	OUNCE
PH	PHASE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
RA	RETURN AIR
REF	REFERENCE
RET	RETURN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAN	SANITARY
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ FT	SQUARE FEET
SR	SHORT RADIUS
SS	STAINLESS STEEL
STD	STANDARD
STM	STEAM
SWP	SAFE WORKING PRESSURE
SD	SMOKE DETECTOR
T	TEMPERATURE
T	THERMOSTAT
T & P	TEMPERATURE AND PRESSURE
TA	THROW-AWAY
TEFC	TOTALLY ENCLOSED FAN COOLED
TEMP	TEMPERATURE
TOL	THREAD-O-LET
TYP	TYPICAL
UC	UNDERCUT
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VENT
VAV	VARIABLE AIR VOLUME
VD	MANUAL VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VTR	VENT THROUGH ROOF
W/O	WITHOUT
W/	WITH
WB	WET BULB TEMPERATURE
WCO	WALL CLEANOUT
WT	WEIGHT

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER
JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : RD
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
GENERAL NOTES - H.V.A.C.

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
M001

LEGEND, INDEX & GENERAL NOTES - H.V.A.C. | 01 | N.T.S.

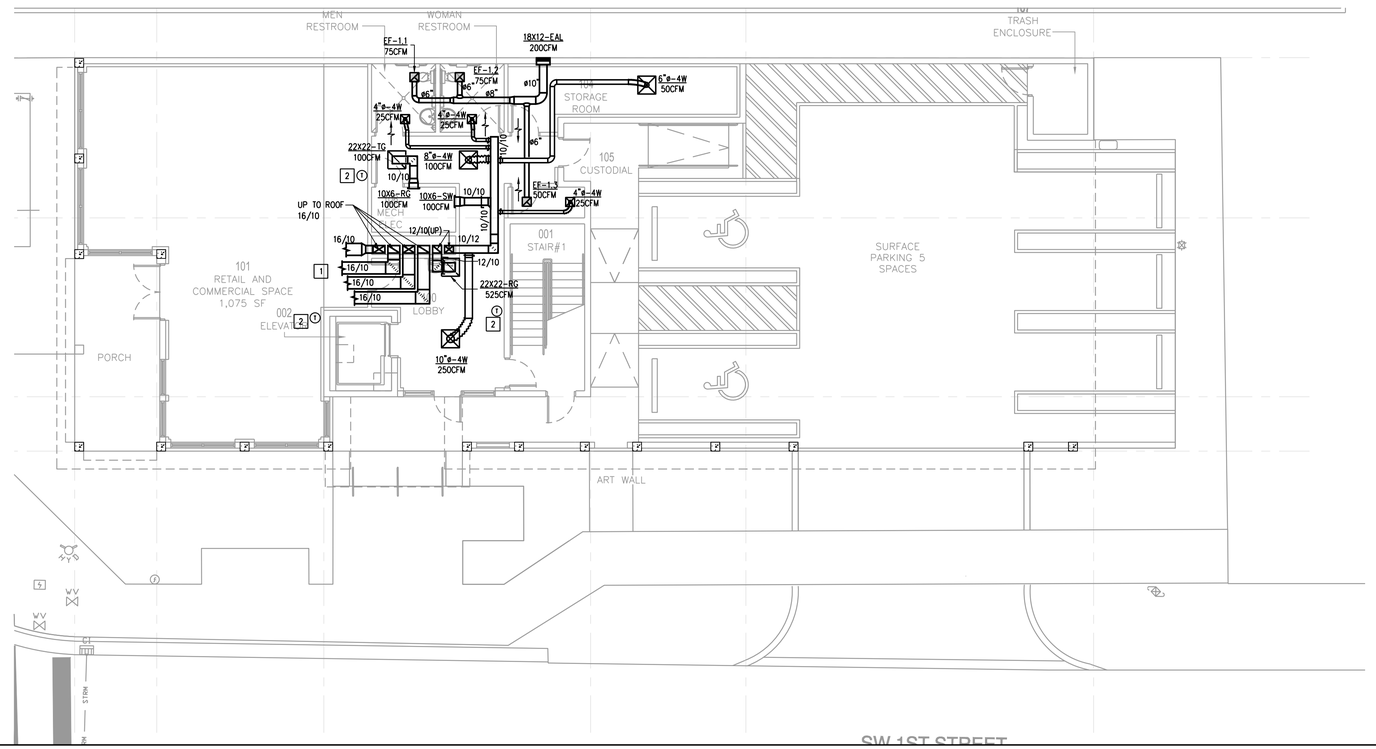
PRINT DATE:1/4/2022 1:33 PM SAVE DATE:12/16/2021 3:52 PM FILE LOCATION:R:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014M001.DWG

GENERAL NOTES

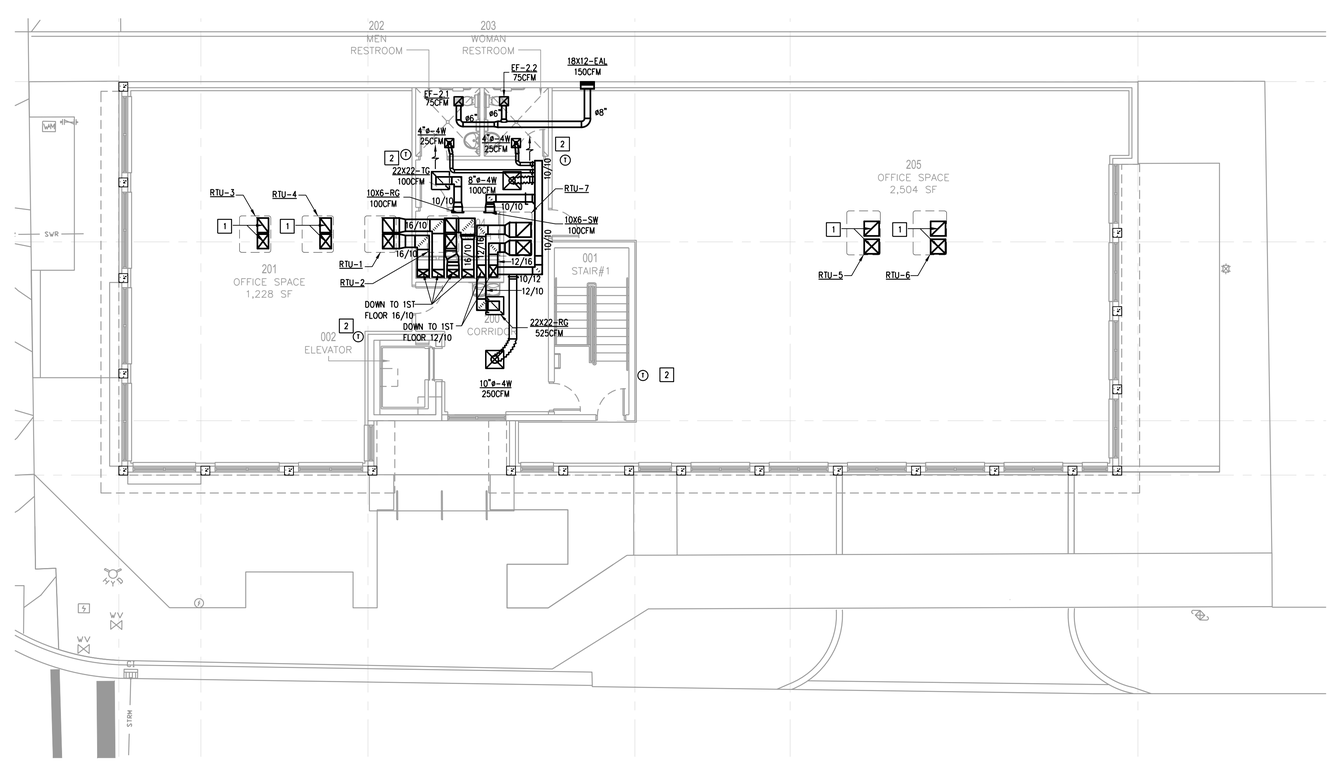
1. LOCATION OF ALL DUCTWORK PENETRATION THOUGH STRUCTURE BEAMS SHALL BE COORDINATED PRIOR TO DUCTWORK OR JOIST FABRICATION. BEAM PENETRATION OPENINGS SHALL BE SIZED TO INCLUDE REQUIRED DUCTWORK INSULATION.
2. PROVIDE FIRE DAMPER FOR ANY DUCTWORK THAT IS PENETRATING THE FIRST FLOOR CEILING. PROVIDE NAME PLATE FOR FIRE DAMPERS.

H.V.A.C. KEYNOTES [X]:

1. OPEN ENDED, SUPPLY AND RETURN AIR DUCTWORK. PROVIDE WITH BIRDSCREEN CONSTRUCTED OF MESH SIZE 1/4"x 1/4" MOUNTED ACROSS RETURN OPENING.
2. PROVIDE THERMOSTAT WITH CLEAR LOCKABLE COVER.



1ST LEVEL FLOOR PLAN - H.V.A.C. | 01 | 1/8"=1'-0"



2ND LEVEL FLOOR PLAN - H.V.A.C. | 02 | 1/8"=1'-0"

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL 32751
FL. REG. NO.: PE57743

COCI CONSULTING ENGINEERS

Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco

2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576

www.ocliassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : RD
Checked By : JLS

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
OPTION 2 - 1ST & 2ND LEVEL FLOOR PLANS - H.V.A.C.

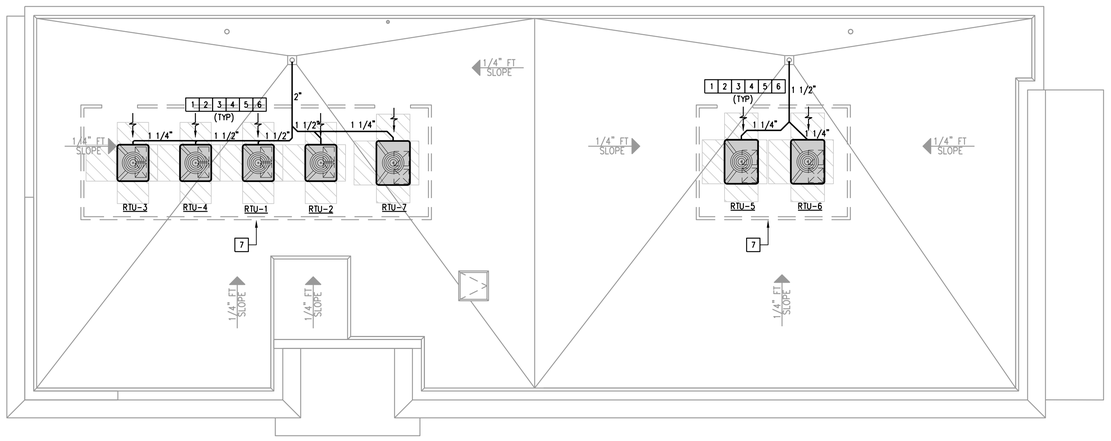
This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :

M101

PRINT DATE:1/4/2022 1:40 PM SAVE DATE:12/17/2021 3:20 PM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014M101.DWG



GENERAL NOTES:

1. COORDINATE ALL PLUMBING VENT THRU ROOF LOCATION WITH PLUMBING CONTRACTOR PRIOR TO ROUGH IN. ENSURE CODE REQUIRED SEPARATION IS PROVIDED BETWEEN EXHAUST/VENT THROUGH ROOF AND OUTSIDE AIR INTAKES.

H.V.A.C. KEYNOTES [X]:

1. ROUTE FULL SIZED CONDENSATE PIPING WITH P-TRAP ABOVE THE ROOF. CONDENSATE SHALL NOT TERMINATE INTO SANITARY. PIPE SLOPE IS 1/8" PER 1'. REFER TO DETAIL AND SPECIFICATION FOR MORE INFORMATION. PROVIDE WITH BUG SCREEN.
2. MAINTAIN MINIMUM 10' CLEARANCE BETWEEN EXHAUST/VENT THROUGH ROOF AND OUTSIDE AIR INTAKES.
3. VERIFY AND MAINTAIN ALL MANUFACTURER CLEARANCES FOR SERVICE.
4. SUPPORT PIPING ABOVE ROOF PER FLORIDA BUILDING CODE. REFER TO DETAIL.
6. INSTALL ROOF TYPE UNIT ON CURB. ROOF CURB SHALL BE NOA RATED. CUT AND PATCH ROOF AS REQUIRED. PROVIDE ANY FRAMING REQUIRED TO MEET THE REQUIREMENTS OF THE UNIT / CURB FLORIDA PRODUCT APPROVAL TESTING.
7. HVAC EQUIPMENT SCREEN. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

ROOF PLAN - H.V.A.C. | 01 | 1/8"=1'-0"

Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : RD
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

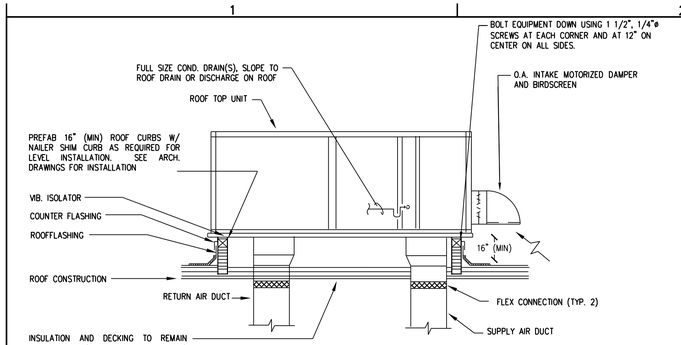
Sheet Title :
ROOF PLAN - H.V.A.C.

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
M102

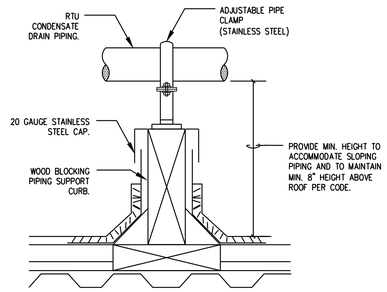
PRINT DATE:1/4/2022 1:40 PM SAVE DATE:12/16/2021 4:04 PM FILE LOCATION:K:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014M102.DWG



1 M501 ROOFTOP UNIT MOUNTING DETAIL

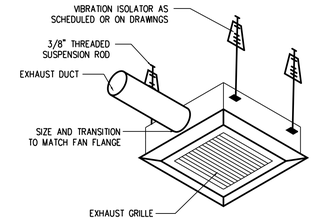
NTS

ALL ROOF MOUNTED EQUIPMENT SHALL BE ANCHORED TO WITHSTAND THE FORCES OF WIND AS OUTLINED IN THE 2020 FLORIDA BUILDING CODE.



2 M501 CONDENSATE DRAIN ROOF PIPE SUPPORT DETAIL

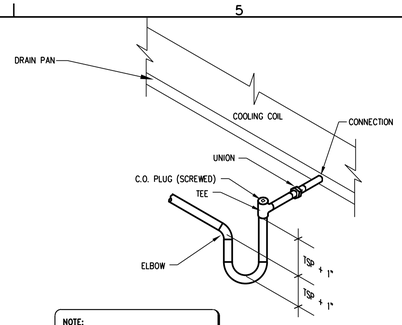
NTS



NOTE: CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ANY CEILING ACCESS OPENINGS, WITH MANUFACTURER.

3 M501 CEILING EXHAUST FAN DETAIL

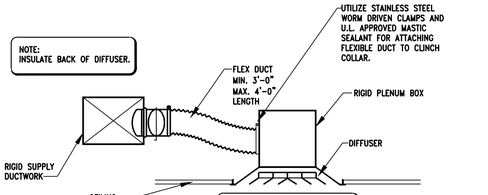
NTS

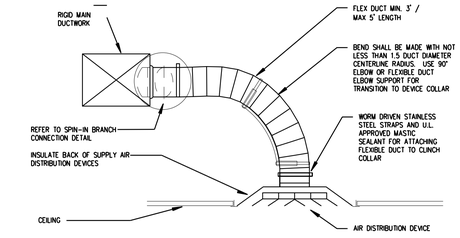


NOTE: PROVIDE FLOAT SWITCH IN DRAIN PAN TO SHUT THE UNIT DOWN WHEN WATER LEVEL IN PAN EXCEEDS 1/2"

4 M501 CONDENSATE DRAIN DETAIL

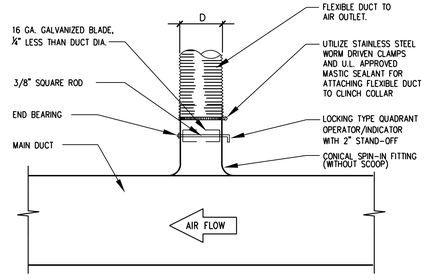
NTS





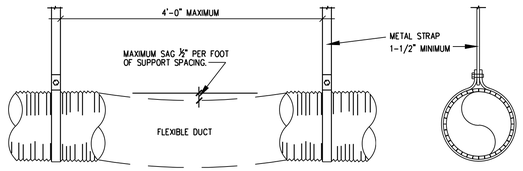
5 M501 DIFFUSER AND FLEX DUCT DETAIL

NTS



6 M501 SPIN-IN BRANCH CONNECTION TO SINGLE AIR OUTLET

NTS

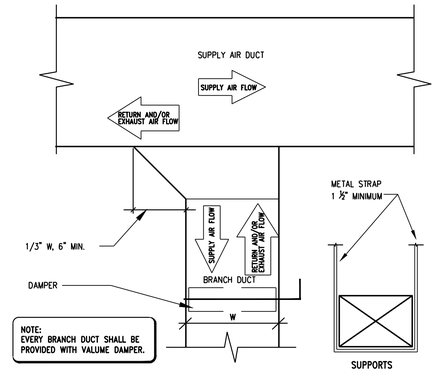


NOTES:

1. DUCT SHOULD EXTEND STRAIGHT FOR SEVERAL INCHES FROM A CONNECTION BEFORE BENDING.
2. SUPPORT SYSTEM MUST NOT DAMAGE DUCT OR CAUSE OUT OF ROUND SHAPE.

7 M501 FLEX DUCT SUPPORT

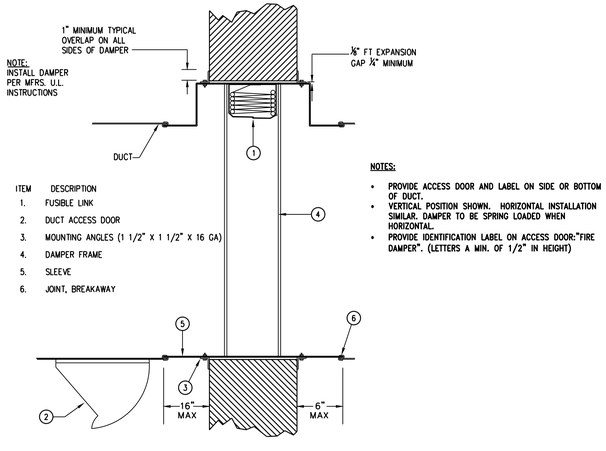
NTS



NOTE: EVERY BRANCH DUCT SHALL BE PROVIDED WITH VALUME DAMPER.

8 M501 DAMPER AT DUCT BRANCH

NTS

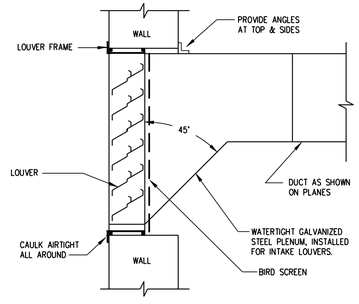


NOTES:

- PROVIDE ACCESS DOOR AND LABEL ON SIDE OR BOTTOM OF DUCT.
- VERTICAL POSITION SHOWN. HORIZONTAL INSTALLATION SIMILAR. DAMPER TO BE SPRING LOADED WHEN HORIZONTAL.
- PROVIDE IDENTIFICATION LABEL ON ACCESS DOOR:"FIRE DAMPER". (LETTERS A MIN. OF 1/2" IN HEIGHT)

9 M501 FIRE DAMPER DETAIL

NTS



NOTE: LOUVER SHALL BE AMCA 540 AND AMCA 550 AND TO BE INSTALLED PER MANUFACTURER'S TESTED ASSEBMLY.

10 M501 WALL LOUVER DETAIL

NTS

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL 32751
FL REG. NO.: PE57743

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : RD
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
DETAILS - H.V.A.C.

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
M501

DETAILS - H.V.A.C.	01	
	N.T.S	

PRINT DATE:1/5/2022 1:50 PM SAVE DATE:1/5/2022 1:46 PM FILE LOCATION:J:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014M501.DWG

ROOF TOP UNIT(DIRECT EXPANSION)

		MARK	RTU-1 & 2	RTU-3 & 4	RTU-5 & 6	RTU-7
		AREA SERVED	1ST FLOOR(RETAIL)	2ND FLOOR(OFFICE-201)	2ND FLOOR(OFFICE-205)	1ST&2ND FLOOR(CORRIDOR)
		AIR FLOW (CFM)	1,000	1,000	1,600	1,200
		OUTSIDE AIR (CFM)	100	100	150	200
		TONNAGE	3.0	3.0	5.0	3.0
AIRSIDE	FAN DATA	AIR FLOW (CFM)	1,000	1,000	1,600	1,200
		ESP (IN H20)	1	1	1	1
		MOTOR SPEED (RPM)	1050	1050	1050	1050
		HP [WATTS]	2	2	1	3
		VOLTAGE/PHASE	240/1	240/1	240/1	240/1
COOLING CAPACITY		ENTERING AIR TEMP (DB)	78.1	78.1	77.8	78.4
		ENTERING AIR TEMP (WB)	65.6	65.6	65.3	65.8
		LEAVING AIR TEMP (DB)	55	55	55	55
		LEAVING AIR TEMP (WB)	54	54	54	54
		TOTAL CAPACITY (MBH)	35	35	55	43
		SENSIBLE CAPACITY (MBH)	23	23	40	30
HEATING		HEAT TYPE	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC
		HEATING OUTPUT (KW)	5	5	8	6
		VOLTAGE/PHASE	240/1	240/1	240/1	240/1
		# OF STAGES	1.0	1.0	1.0	1.0
CONDENSING SIDE	CONDENSERS	QUANTITY OF FANS	1	1	1	1
		VOLTAGE/PHASE	240/1	240/1	240/1	240/1
		FLA (EACH.)	1.1	1.1	1.7	1.7
	COMPRESSORS	QUANTITY	1	1	1	1
		VOLTAGE/PHASE	240/1	240/1	240/1	240/1
		RLA (EACH)	15.4	15.4	24.4	19.6
		LRA (EACH)	83.9	83.9	144.2	130
		MCA	24.5	24.5	39.1	32.0
		MOP	40	40	60	50
		WEIGHT (LBS.)	380	380	490	460
EFFICIENCY RATINGS		EER	**12.0**	**12.0**	**11.5**	**11.5**
DESIGN BASIS		MANUFACTURER	TRANE	TRANE	TRANE	TRANE
		MODEL	4TCC4036A	4TCC4036A	4TCC4060A	4TCC4048A
		NOTES	1 to 12	1 to 12	1 to 12	1 to 12

NOTES:

1. PROVIDE WITH WALL MOUNTED, 7-DAY DIGITAL PROGRAMMABLE THERMOSTAT WITH CLEAR LOCKABLE COVER.
2. PROVIDE WITH SINGLE POINT CONNECTION FOR ELECTRIC HEATER AND FAN FOR INDOOR UNIT.
3. PROVIDE WITH POWERED CONVENIENCE POWER OUTLET.
4. PROVIDE EACH UNIT WITH BI-POLAR IONIZATION AT COOLING COIL EQUAL TO GLOBAL PLASAMA SOLUTIONS I-MOD.
5. UNIT SHALL HAVE DRY BULB ECONOMIZER WITH BAROMETRIC RELIEF.
6. UNIT SHALL BE SUITABLE FOR THE SEACOAST APPLICATION.
7. PROVIDE WITH ROOF CURB.
8. PROVIDE WITH HIGH HUMIDITY RATED DAMPERS.
9. EACH UNIT SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE SHOWING SPECIFIC UNIT DESIGNATION.
10. PROVIDE WITH HAIL GUARDS.
11. PROVIDE WITH HINGED ACCESS DOORS.
12. PROVIDE WITH ECM MOTOR.

AIR DISTRIBUTION DEVICE SCHEDULE

MARK/LEGEND	TYPE	MANUFACTURER	MODEL	NOTES
NECK SIZE 10"Ø-4W THROW AIR QUANTITY 300CFM	CEILING MOUNTED SQUARE SUPPLY DIFFUSER	METALAIRE	5700 AL	1,2,4,5,6,7
NECK SIZE 8X8-SW THROW AIR QUANTITY 200CFM	SIDEWALL MOUNTED RECTANGULAR SUPPLY DIFFUSER	METALAIRE	4000-AF	1,5,6
NECK SIZE 8X8-RG THROW AIR QUANTITY 300CFM	CEILING OR SIDEWALL RETURN AIR GRILLE	METALAIRE	RH	1,2,3,4,5,6
NECK SIZE 8X8-EG THROW AIR QUANTITY 300CFM	CEILING OR SIDEWALL MOUNTED EXHAUST AIR GRILLE	METALAIRE	RH	1,2,3,4,5,6
NECK SIZE 10"Ø-TG THROW AIR QUANTITY 300CFM	CEILING OR SIDEWALL MOUNTED TRANSFER AIR GRILLE	METALAIRE	RH	1,2,3,4,5,6
LOUVER SIZE 24X24-OAL	WALL MOUNTED OUTSIDE AIR LOUVER	GREENHECK	EHV-550D	6,8,10
LOUVER SIZE 24X24-EAL	WALL MOUNTED EXHAUST DISCHARGE LOUVER	GREENHECK	EHV-550D	6,8,10

NOTES:

1. PROVIDE WITH OPPOSED BLADE VOLUME DAMPER.
2. PROVIDE 24X24 FULLY LOUVERED FACE LAYIN MODULE WHERE LOCATED IN LAYIN CEILING.
3. NECK SIZE IS 22X22 UNLESS NOTED OTHERWISE ON FLOOR PLANS.
4. PROVIDE SQUARE TO ROUND NECK TRANSITION WHERE APPLICABLE.
5. COORDINATE BORDER TYPES WITH ARCHITECTURAL FLOOR PLAN AND REFLECTED CEILING PLAN.
6. COORDINATE FINISH WITH ARCHITECT.
7. COORDINATE THROW PATTERN WITH FLOOR PLANS.
8. PROVIDE COMPLETE WITH WALL SLEEVE AND BIRDSCREEN.
10. LOUVER SHALL HAVE FLORIDA PRODUCT APPROVAL FOR WIND LOAD, AMCA 550, AMCA 540 AND MUST BE INSTALLED IN ACCORDANCE WITH ITS REQUIREMENTS.

AIR PURIFICATION DEVICE SCHEDULE

Zone Tag	S/A Flow	Pressure Drop	Voltage	Watts	Mounting	Manufacturing	Model	Notes
RTU-1&2	1,000	0.05" W.C.	120V	60	COIL	GPS	I-MOD	1 to 7
RTU-3&4	1,000	0.05" W.C.	120V	60	COIL	GPS	I-MOD	1 to 7
RTU-5&6	1,600	0.05" W.C.	120V	60	COIL	GPS	I-MOD	1 to 7
RTU-7	1,200	0.05" W.C.	120V	60	COIL	GPS	I-MOD	1 to 7

Notes:

1. Max coil height per 1-BAR=60".If coil height exceeds 60" two I-Mod are required. Field verify existing coil height.
2. Mount IMOD to air inlet side of cooling coil, along top of cooling coil.
3. Unit to include power supply which will accept 24/120/208/240VAC input power.
4. Bi-polar ionization systems requiring perishable glass tubes are not acceptable
5. All manufacturers must pass UL-867-2007 ozone chamber testing by either UL or ETL
6. Ionization bar to have a minimm of 1 needlepoint every 0.75" of coil width.
7. Field verify coil widths.

Duct Construction Schedule

Service	SMACNA Pressure Class	Material	Insulation	Notes
Supply Air Ducts				
From AHU connection to 20 feet downstream on supply side for constant volume systems	+ 2"	Doublewall round / flat oval or rectangular complete with perforated inner liner and mylar film separating insulation from air stream	1" thick internally lined	(1)(2)
From 20 feet downstream of AHU to air distribution devices for constant volume systems	+ 2"	Single wall sheet metal	Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board	(1)
All low pressure exposed ductwork in public areas	+ 2"	Doublewall round complete with perforated inner liner and mylar film separating insulation from air stream	1" thick internally lined	(1)(2)
Return Air Ducts				
From AHU connection to 20 feet upstream on return side for all AHU's and all exposed return air ductwork	- 2"	Doublewall rectangular complete with perforated inner liner and mylar film separating insulation from air stream. Provide round or flat oval as shown on the drawings where ductwork is exposed.	1" thick internally lined	(1)(2)
All other return air ductwork	- 2"	Single wall sheet metal	Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board	(1)
Outside Air Ducts				
All outside air ducts	- 2"	Single wall sheet metal	Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board	(1)
Transfer Air Ducts				
All transfer air ducts	+ 1"	Single wall sheet metal	Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board	(1)
Dust Collector Return ducts	+ 1"	Single wall sheet metal		(1)
Exhaust Air Ducts				
General exhaust ducts	- 2"	Single wall sheet metal.		(1)
Dust Collector exhaust ducts	- 2"	Spiral round duct.		(1)

Notes:
(1) All ductwork is to be fabricated, supported and installed per SMACNA standards.
(2) Refer to Specifications for material to be used for internal lining.

General note:
Where supply, return or outside air ductwork is called to be externally insulated and is exposed in mechanical rooms, blanket duct wrap may be used in lieu of rigid board insulation.

FAN SCHEDULE

MARK	SERVICE	TYPE	FAN DATA CFM	FAN DATA ESP (IN.)	FAN DATA DRIVE	FAN DATA RPM	MOTOR DATA HP [WATTS]	MOTOR DATA V/PH	SOUND DATA SONES/[Db]	WEIGHT (LBS.)	MFG.	MODEL	NOTES
EF-1.1	RESTROOM	CEILING	75	0.5	DIRECT	950	[80]	115/1	3	10	GREENHECK	SP-B110	ALL
EF-1.2	RESTROOM	CEILING	75	0.5	DIRECT	950	[80]	115/1	3	10	GREENHECK	SP-B110	ALL
EF-1.3	JANITOR	CEILING	50	0.5	DIRECT	950	[80]	115/1	3	10	GREENHECK	SP-B110	ALL
EF-2.1	RESTROOM	CEILING	75	0.5	DIRECT	950	[80]	115/1	3	10	GREENHECK	SP-B110	ALL
EF-2.2	RESTROOM	CEILING	75	0.5	DIRECT	950	[80]	115/1	3	10	GREENHECK	SP-B110	ALL

NOTES
(1) PROVIDE DISCONNECT SWITCH MOUNTED AT THE UNIT.
(2) PROVIDE WITH BACKDRAFT DAMPER.
(3) DIRECT DRIVE HIGH EFFICIENCY DC MOTOR WITH INTEGRAL TRANSFORMER AND SPEED CONTROL DIAL.
(4) FAN SHALL BE INTERLOCKED WITH THE OCCUPANCY SENSOR FOR CONTROL WITH 10 MINUTE TIME DELAY.
(5) EACH UNIT SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE SHOWING SPECIFIC UNIT DESIGNATION.

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

OCLI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.oclassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : RD
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
SCHEDULES - H.V.A.C.

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
M601

PRINT DATE:1/4/2022 1:47 PM SAVE DATE:12/16/2021 4:04 PM FILE LOCATION:L:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014M601.DWG

GENERAL NOTES

1. EACH CONTRACTOR, PROPOSER, SUPPLIER AND/OR MANUFACTURER SHALL REFER TO ALL DOCUMENTS PERTAINING TO THIS PROJECT AND COORDINATE ACCORDINGLY SO AS TO INSURE ADEQUACY OF FIT, COMPLIANCE WITH SPECIFICATIONS, PROPER VOLTAGE AND CURRENT CHARACTERISTICS TO AVOID CONFLICTS WITH ANY OTHER BUILDINGS SYSTEMS. VERIFY SAME WITH SHOP DRAWINGS.
2. INSTALL NO PIPING, CONDUIT, DUCTWORK, ETC. IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING AND THE COLLECTION OF CONDENSATION THEREON. IF IN DOUBT, CONTACT THE ARCHITECT.
3. ADVISE ARCHITECT OF ANY CONFLICTS, ERRORS, OMISSIONS, ETC., AT LEAST TEN DAYS PRIOR TO BID DATE, TO ALLOW CLARIFICATIONS BY WRITTEN ADDENDUM.
4. DEVIATIONS FROM SPECIFICATIONS OR PLANS REQUIRES PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND MUST BE SUBMITTED IN WRITING NO LATER THAN TEN DAYS PRIOR TO THE BID DATE.
5. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY,COUNTY, LOCAL, STATE, FEDERAL, MUNICIPALITY, UTILITY COMPANY, OSHA, ETC..)
6. INSTALL EQUIPMENT, MATERIALS, ETC.. IN STRICT ACCORD WITH MANUFACTURERS' RECOMMENDATIONS AND DIRECTIONS. IF IN CONFLICT WITH THE DESIGN INTENT IN CONTRACT DOCUMENTS, ADVISE THE ARCHITECT PRIOR TO INSTALLATION FOR CLARIFICATIONS.
7. ALL SYSTEMS, EQUIPMENT, AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ARCHITECT.
8. ALL WORK, MATERIALS, EQUIPMENT, ETC. SHALL BE FULLY GUARANTEED FOR ONE FULL CALENDAR YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION AS DOCUMENTED BY THE ARCHITECT, UNLESS LONGER WARRANTY PERIODS FOR EQUIPMENT ARE SPECIFIED.
9. UNLESS OTHERWISE SPECIFIED OR INDICATED, ALL EQUIPMENT AND/OR MATERIALS WITHIN OCCUPIED SPACES OR EXPOSED TO VIEW ON THE BUILDING EXTERIOR SHALL BE PRIMED AND FINISHED SO AS TO COMPLEMENT ADJACENT SURFACE, UNLESS OTHERWISE NOTED. COORDINATE WORK WITH ARCHITECT.
10. ALL ELECTRICAL COMPONENTS OR EQUIPMENT SHALL BE LABELED BY UNDERWRITER'S LABORATORIES OR OTHER APPROVED LISTING AGENCY. APPROVED AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT, UNLESS WAIVED BY THE ARCHITECT IN WRITING.
11. ALL CONTRACTORS SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO INSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE OR SUB-SERVICE FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRIC LINES. VERIFY THE LOCATION, SIZE TYPE, ETC. OF EACH UNDERGROUND OR OVERHEAD UTILITY. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL FEDERAL, STATE AND/OR LOCAL RULES, REGULATIONS, STANDARDS AND SAFETY REQUIREMENTS. UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
12. ALL SUPPORTS FOR EQUIPMENT, DEVICES OR FIXTURES SHALL BE UNIQUE, SUPPORT FROM THE BUILDING STRUCTURE. DO NOT SUPPORT WORK FROM OTHER TRADES, EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT AND CONSENT OF THE OTHER TRADE, IN WRITING.
13. WHERE INTERRUPTING AN EXISTING UTILITY OR SERVICE DELIBERATELY OR ACCIDENTALLY THE RESPONSIBLE CONTRACTOR SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME PROVIDING PREMIUM TIME AS NEEDED.
14. WHERE PENETRATING NEW ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. COORDINATE ALL SUCH PENETRATIONS WITH THE ROOFING INSTALLER/ARCHITECT.
15. THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY COMPANY FEES, CASH CONTRIBUTIONS OR OTHER COSTS THAT THE UTILITY COMPANY MAY REQUIRE TO COMPLETE THEIR WORK. (ELECTRIC, TELEPHONE, TELEVISION, ETC..)
16. DEVIATIONS IN SIZE, CAPACITIES, FIT, FINISH, ETC. FOR EQUIPMENT FROM THAT PRIME SPECIFIED SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ARCHITECT OR NOT SHALL BE THE RESPONSIBILITY OF THE PURCHASER.
17. INTERRUPTION OF ANY EXISTING SERVICES SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR, UTILITY COMPANY, ARCHITECT, AND OWNER AS NECESSARY, WITH AT LEAST ONE WEEK IN ADVANCE OF ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN PARTIES MENTIONED, TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED TWO WEEKS IN ADVANCE, IN WRITING. IF UTILITY COMPANY REQUIRES A LONGER NOTIFICATION PERIOD, SO PROVIDE.
18. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. IF IN DOUBT, CONTACT THE ARCHITECT FOR CLARIFICATION PRIOR TO INSTALLING ANY SUCH WORK.
19. DO NOT SCALE FROM DRAWINGS, AS PRINTING DISTORTS SCALE, WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONED SUPPLIED TO THE CONTRACTOR.
20. IT IS NOT INTENDED THAT THE PLANS SHOW ALL OFFSETS IN PIPES, CONDUITS, AND DUCTS REQUIRED FOR INSTALLATION OF THE WORK DETAILS AND SECTIONS ARE INCLUDED FOR SOME AREAS TO SHOW INTENDED RELATIONSHIP OF THE WORK OF VARIOUS TRADES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SUB-CONTRACTORS TO COORDINATE INSTALLATION OF THE WORK AND TO PROVIDE THE NECESSARY OFFSETS, TRANSFORMATIONS, AND FITTINGS REQUIRED. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR CORRECTING CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTORS' CONVENIENCE AND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.
21. ALL WORK SHOWN ON DRAWINGS (EQUIPMENT, DUCTWORK, PIPING FIXTURES, RACEWAYS, WIRING, ETC.) ARE NEW, TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS NOTED OTHERWISE.
22. ALL PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE. COORDINATION WITH ALL TRADES WILL BE REQUIRED.
23. REFER TO DOMESTIC WATER RISER DIAGRAM FOR LOCATIONS OF ALL VALVES AND ACCESSORIES TO BE INSTALLED.
24. WATER HAMMER ARRESTORS, TRAP PRIMERS, VALVES, ETC. SHALL BE ACCESSIBLE. PROVIDE ACCESS PANELS WHERE ANY ITEM IS INSTALLED IN AN INACCESSIBLE SPACE.
25. INSULATE HOT AND COLD WATER IN ACCORDANCE WITH FLORIDA ENERGY EFFICIENCY CODE.
26. METALLIC PIPING SHALL BE INSTALLED IN FIRE RATED WALL. (TYPICAL)
27. SEAL ALL PIPING PENETRATIONS WITH NON-SHRINK MASTIC.
28. DOMESTIC WATER PIPING WITHIN 5 FEET OF THE BUILDING SEWER/DRAIN PIPING IS TO BE A MINIMUM OF 12 INCHES ABOVE THE HIGHEST POINT OF THE BUILDING SEWER/DRAIN PIPING AND THE PIPE MATERIALS MUST CONFORM TO SECTION 703.1 OF THE FLORIDA BUILDING CODE - PLUMBING.
29. PLUMBING CONTRACTOR SHALL COORDINATE UNDERGROUND PIPING WITH BUILDING FOUNDATION.
30. WHERE PIPING PENETRATES FOOTING, REFER TO STRUCTURAL DRAWINGS FOR SLEEVING METHODS.
31. WHERE INVERT ELEVATIONS ARE HIGHER ON PLUMBING DRAWINGS, PLUMBING CONTRACTOR SHALL INSTALL PIPING AS PER THE PLUMBING CONTRACT DRAWINGS AND PROVIDE A 45° DROP TO MEET THE CIVIL ENGINEERS POINT OF CONNECTION. IF ANY CONFLICTS ARISE WHERE CIVIL ENGINEERS' POINT OF CONNECTIONS ARE SHALLOWER THAN ON THE PLUMBING CONTRACT DOCUMENTS, PLUMBING CONTRACTOR SHALL CONTACT THE ARCHITECT/ENGINEER.
32. SUPPLY AND TRAP WRAPS SHALL BE PROVIDED AT ADA LAVATORIES AND SINKS WHERE PIPING IS EXPOSED.
33. WHERE PIPING IS NEAR ROOF ACCESS HATCH CONTRACTOR SHALL ROUTE ALL PIPING TO CLEAR ALL LADDERS AND OPENINGS.
34. COORDINATE VENT THRU ROOF WITH ALL EQUIPMENT . WHERE PIPING IS WITHIN 10'-0" OF EQUIPMENT, LOUVERS ECT. VENT THRU ROOF SHALL BE MOVED TO MAINTAIN A 10'-0" CLEARANCE OF OUTSIDE AIR OPENING.
35. WHEN NONMETALLIC PIPE IS USED IN COMBINATION SYSTEMS UTILIZING STEEL PIPING INTERNALLY COATED WITH CORROSION INHIBITORS AND NONMETALLIC PIPING, THE STEEL PIPE COATING SHALL BE INVESTIGATED FOR COMPATIBILITY WITH THE NONMETALLIC PIPING BY A TESTING LABORATORY.
36. WHEN FABRICATING STEEL PIPE FOR A COMBINATION (CPVC-STEEL) SYSTEM, THE CUTTING OIL AND LUBRICANTS CAN CAUSE PERFORMANCE DEGRADATION OF THE CPVC PIPING. CUTTING OILS AND LUBRICANTS FOUND TO BE COMPATIBLE ARE AVAILABLE AND SHALL BE USED.
37. WHEN NONMETALLIC PIPE IS USED IN COMBINATION SYSTEMS UTILIZING STEEL PIPE THAT IS NOT INTERNALLY COATED WITH CHEMICAL CORROSION INHIBITORS, NO ADDITIONAL EVALUATIONS SHALL BE REQUIRED.
38. WHEN NONMETALLIC PIPE IS USED IN COMBINATION SYSTEMS UTILIZING STEEL PIPE, CUTTING OILS AND LUBRICANTS USED FOR FABRICATION OF THE STEEL PIPING SHALL BE COMPATIBLE WITH THE NONMETALLIC PIPE MATERIALS.
39. FIRE-STOPPING MATERIALS INTENDED FOR USE ON NONMETALLIC PIPING PENETRATIONS SHALL BE INVESTIGATED FOR COMPATIBILITY WITH THE NONMETALLIC PIPE MATERIALS.
40. ALL CPVC PIPING, FITTINGS AND SOLVENTS SHALL BE FROM A SINGLE MANUFACTURERS. MIXING OF MANUFACTURERS IS NOT ALLOWED OR PERMITTED.
41. CPVC PIPING INSTALLATION SHALL BE IN CONFORMANCE WITH MANUFACTURES SPECIFICATIONS AND GUIDELINES.

ABBREVIATIONS / GENERAL LEGEND

APPROX	APPROXIMATELY
A.C.	ABOVE CEILING
B.F.	BELOW FLOOR
BFF	BELOW FINISHED FLOOR
B.O.P.	BOTTOM OF PIPE
CFH	CUBIC FEET PER HOUR
CO	CLEAN-OUT
COND	CONDENSATE OR CONDENSER
CW	DOMESTIC COLD WATER
DF	DRINKING FOUNTAIN
DN	DOWN
ECO	EXTERIOR CLEANOUT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EL	ELEVATION
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HD	HUB DRAIN
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
IWH	INSTANTANEOUS WATER HEATER
L	LAVATORY
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
MS	MOP SINK
RCP	RECIRCULATING PUMP (HWR)
RM	ROOM
S	SINK
T.O.P.	TOP OF PIPE
TYP	TYPICAL
VTR	VENT THRU ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WALL HYDRANT
WWB	WASHER WALL BOX
W.S.	WASTE STACK

DIRECTION OF FLOW IN PIPE
PIPE UP
PIPE DOWN
BALL VALVE
CIRCUIT SOLVER BALANCING VALVE AND CHECK VALVE ASSEMBLY, HORIZONTAL SWING
CHECK VALVE, HORIZONTAL SWING
GATE VALVE
PRV — PRESSURE REDUCING VALVE
BACK WATER VALVE
VALVE IN SERVICE BOX WITH HEAVY DUTY COVER
FCO — FLOOR CLEANOUT
ECO — EXTERIOR CLEANOUT
EXTERIOR 2-WAY CLEANOUT
WCO — WALL CLEANOUT
CO — HORIZONTAL CLEANOUT
CAPPED LINE
HOSE BIBB
FLOOR DRAIN
WATER HAMMER
DOMESTIC COLD WATER PIPING
SAN — SOIL, WASTE, OR SANITARY SEWER PIPING
VENT PIPING
ST — PRIMARY STORM DRAIN PIPING
AUX — OVERFLOW STORM DRAIN PIPING

PLUMBING FIXTURE SCHEDULE

MARK	WC-1 ADA	L-1 ADA	MS-1	EWC-1	FD-1	WH-1	RD-1	RD-2
DESCRIPTION	WATER CLOSET FLOOR MOUNT (1)(3)	LAVATORY WALL HUNG (3)(5)	MOP SINK	ELECTRICAL WATER COOLER HIGH/LOW	FLOOR DRAIN W/TRAP PRIMER (4)	WALL HYDRANT	ROOF DRAIN	OVERFLOW ROOF DRAIN
MANUFACTURER	KOHLER	KOHLER	FIAT	ELKAY	WATTS	WATTS	WATTS	WATTS
MODEL NO.	K-4405	K-2805	MSB2424	EZSTLBLC	FD-100-A-7	HY-430	RD-306-K	RD-306-R-K
CARRIER	-	-	-	-	-	-	-	-
MANUFACTURER	-	(2)	-	-	-	-	-	-
MODEL NO.	-	-	-	-	-	-	-	-
FLUSH VALVE	-	-	-	-	-	-	-	-
MANUFACTURER	KOHLER	-	-	-	-	-	-	-
MODEL NO.	K-7521 (1.28 GPF)	-	-	-	-	-	-	-
SUPPLY FITTING	(2)	(2)	(2)	(2)	-	-	-	-
MANUFACTURER	-	-	-	-	-	-	-	-
MODEL NO.	-	-	-	-	-	-	-	-
QUANTITY	1	2	2	2	-	-	-	-
FAUCET	-	-	-	-	-	-	-	-
MANUFACTURER	-	KOHLER	KOHLER	-	-	-	-	-
MODEL NO.	-	K-13466 (0.5 GPM)	K-8907	-	-	-	-	-
DRAIN	-	(2)	(2)	-	-	-	-	-
MANUFACTURER	-	-	-	-	-	-	-	-
MODEL NO.	-	-	-	-	-	-	-	-
TRAP	-	(2)	(2)	(2)	-	-	-	-
MANUFACTURER	-	-	-	-	-	-	-	-
MODEL NO.	-	-	-	-	-	-	-	-

SPECIAL ITEMS
(1) PROVIDE WITH ELONGATED OPEN FRONT SEAT.
(2) PROVIDED BY PLUMBING CONTRACTOR.
(3) MOUNTING HEIGHT PER LOCAL, STATE HANDICAP CODES.
(4) PROVIDE WITH TRAP PRIMER AND CONNECT VIA TRAP PRIMER PPP OR SEE SAFE WASTE DETAIL THIS SHEET.
(5) PROVIDE THERMOSTATIC MIXING VALVE ASME 1070 RATED BELOW LAV PER MANUFACTURER'S INSTRUCTIONS WITH LEAVING TEMPERATURE SET AT 110° F. MAXIMUM.

WATER HEATER SCHEDULE

MARK	EWH-1
MANUFACTURER	A.O. SMITH
MODEL NO.	DEL 10
TYPE	ELECTRIC
GALLONS STORAGE	10
MBH INPUT	-
KW	1.5
VOLTAGE/PHASE	240/1/60

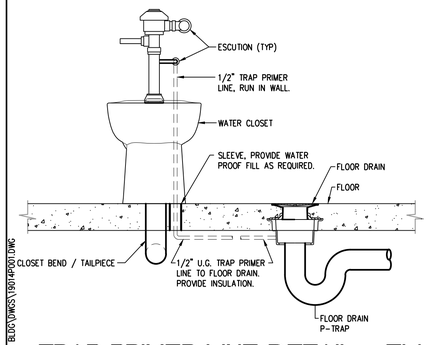
NOTES:
(1) PROVIDE WITH WATTS DET-5-M1 OR EQUAL THERMAL EXPANSION TANK.

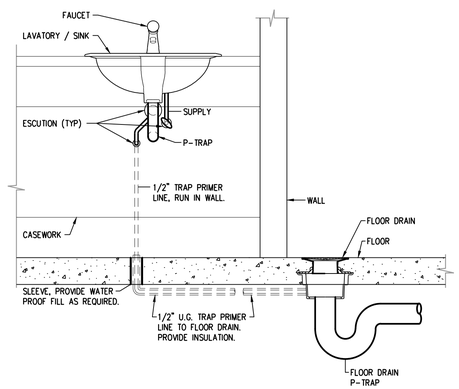
SHOCK ARRESTOR SCHEDULE

MANUFACTURER	MODEL	FIXTURE UNITS
WATTS	SG-050	1-11
WATTS	SG-075	12-32
WATTS	SG-100	33-60
WATTS	SG-125	61-113
WATTS	SG-150	114-154
WATTS	SG-200	155-330

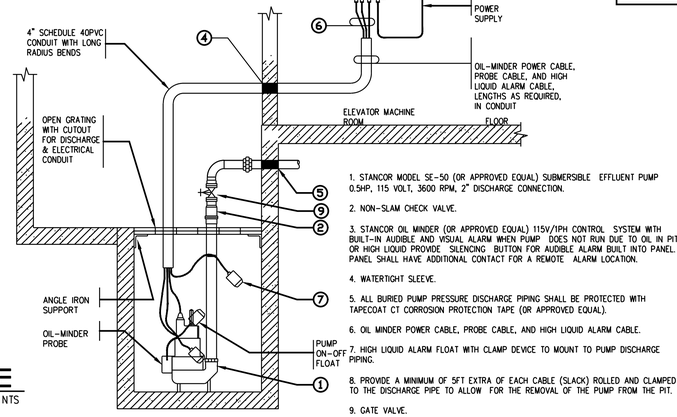
CLEANOUT SCHEDULE

DESIGNATION	MANUFACTURER	SERIES
FCO	WATTS	CO-200-SX
WCO	WATTS	CO-450-RD
ECO	WATTS	CO-380



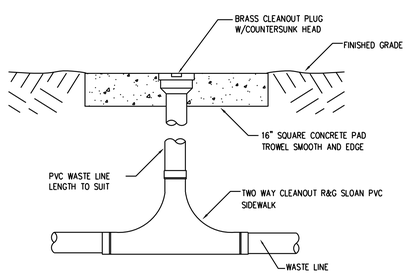


TRAP PRIMER LINE DETAIL - FLUSH VALVE TAIL PIECE AND SAFE WASTE
NTS

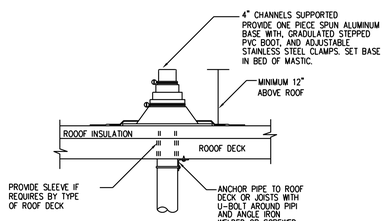


1. STANCOR MODEL SE-50 (OR APPROVED EQUAL) SUBMERSIBLE EFFLUENT PUMP 0.5HP, 115 VOLT, 3600 RPM, 2" DISCHARGE CONNECTION.
2. NON-SLAM CHECK VALVE.
3. STANCOR OIL MINDER (OR APPROVED EQUAL) 115V/1PH CONTROL SYSTEM WITH BUILT-IN AUDIBLE AND VISUAL ALARM WHEN PUMP DOES NOT RUN DUE TO OIL IN PIT OR HIGH LIQUID PROVIDE SILENCING BUTTON FOR AUDIBLE ALARM BUILT INTO PANEL. PANEL SHALL HAVE ADDITIONAL CONTACT FOR A REMOTE ALARM LOCATION.
4. WATERTIGHT SLEEVE.
5. ALL BURIED PUMP PRESSURE DISCHARGE PIPING SHALL BE PROTECTED WITH TAPECOAT CT CORROSION PROTECTION TAPE (OR APPROVED EQUAL).
6. OIL MINDER POWER CABLE, PROBE CABLE, AND HIGH LIQUID ALARM CABLE.
7. HIGH LIQUID ALARM FLOAT WITH CLAMP DEVICE TO MOUNT TO PUMP DISCHARGE PIPING.
8. PROVIDE A MINIMUM OF 5FT EXTRA OF EACH CABLE (SLACK) ROLLED AND CLAMPED TO THE DISCHARGE PIPE TO ALLOW FOR THE REMOVAL OF THE PUMP FROM THE PIT.
9. GATE VALVE.

ELEVATOR SUMP PUMP DETAIL
NTS

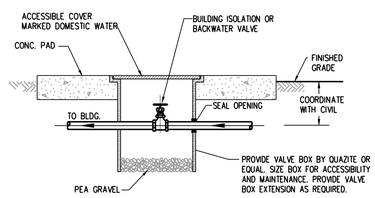


2-WAY CLEANOUT DETAIL
NTS

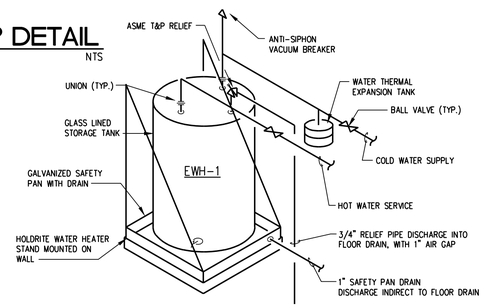


REFER TO PLANS FOR VTR PIPE SIZES AND LOCATIONS. LOCATE VENT THRU ROOF MINIMUM TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR INTAKE, AND ONE FOOT FROM ANY VERTICAL SURFACE.

VENT THRU ROOF DETAIL
NTS



VALVE BOX DETAIL
NTS



ELECTRIC WATER HEATER DETAIL
SCALE: NONE

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER
JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL 32751
FL. REG. NO.: PE57743

COCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : XXX
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

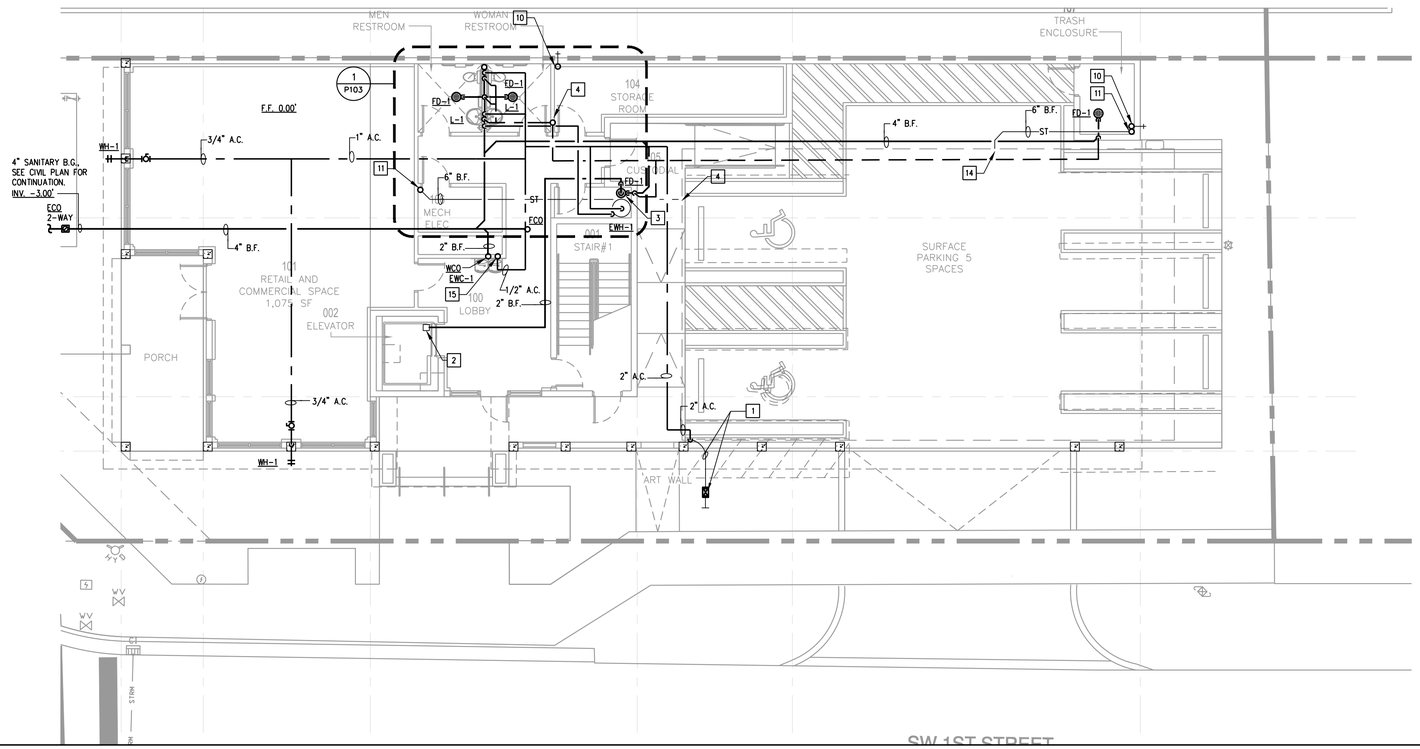
Sheet Title :
GENERAL NOTES - PLUMBING

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
P001

PRINT DATE:1/4/2022 1:41 PM SAVE DATE:12/16/2021 11:14 AM FILE LOCATION:X:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014P001.DWG

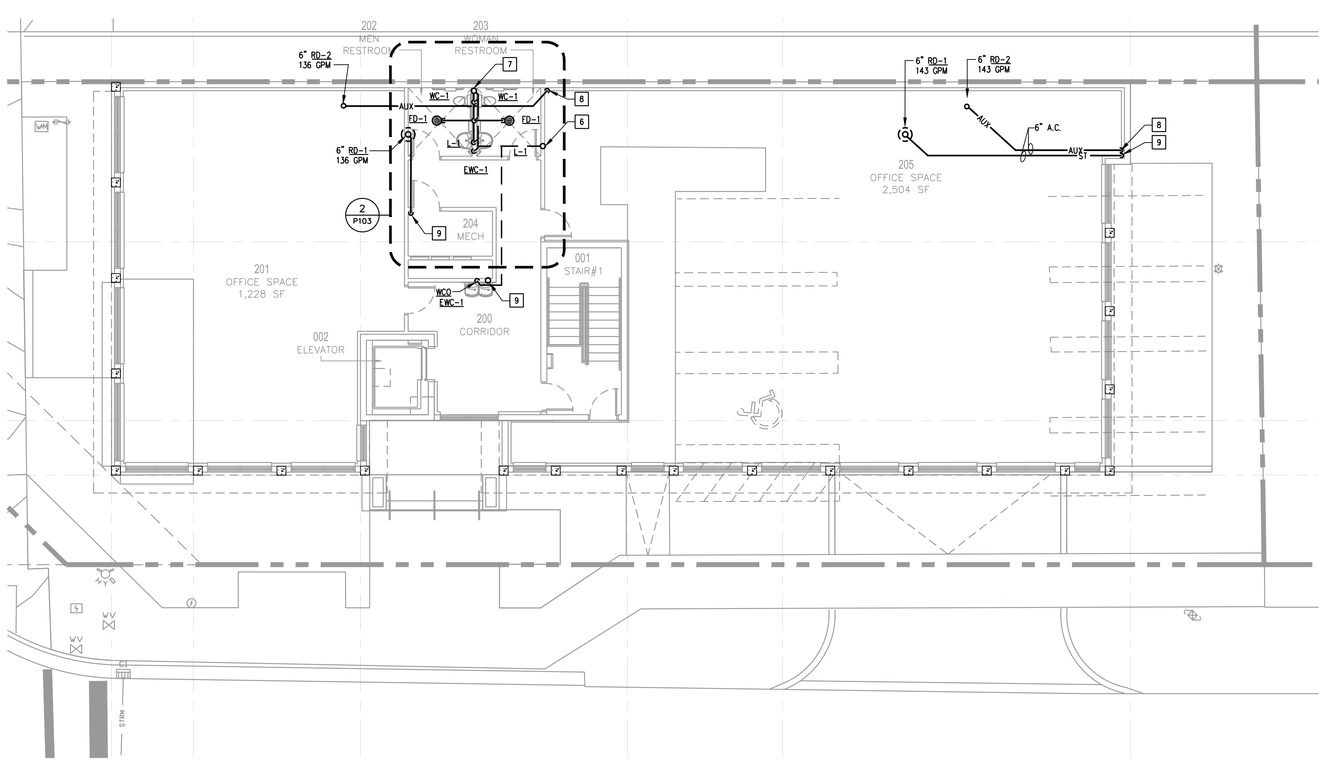
GENERAL NOTES - PLUMBING	01
	1/8"=1'-0"



PLUMBING KEYNOTES [X]:

1. 2" DOMESTIC WATER PIPING BELOW GRADE WITH SHUT-OFF VALVE IN SERVICE BOX WITH CAST IRON COVER. REFER TO CIVIL UTILITY SITE PLAN FOR CONTINUATION.
2. SUMP PIT SUM PUMP SHALL BE SIMILAR TO TYPICAL STANCOR SIMPLEX MULTI-OPTION OIL-MINDER SYSTEM MODEL NUMBER SE-50. PROVIDE WITH A BACK WATER VALVE. REFER TO ARCHITECTURAL & STRUCTURAL PLANS FOR EXACT SIZE AND LOCATION OF SUMP PIT.
3. 2" PUMPED DISCHARGE FROM ELEVATOR SUMP PUMP TO TERMINATE WITH AIR GAP TO FD-1
4. 2" V.S. UP IN CHASE TO ABOVE.
5. 4" W.S. DOWN IN CHASE TO B.F.
6. 2" V.S. UP IN CHASE FROM BELOW.
7. 4" W.S. DOWN IN CHASE TO BELOW AND 3" V.S. UP TO 3" VTR.
8. 6" OVERFLOW STORM PIPING DOWN IN CHASE TO BELOW.
9. 6" STORM PIPING DOWN IN CHASE TO BELOW.
10. 6" OVERFLOW STORM PIPING FROM ABOVE, DOWN ON WALL TO 12" A.F.G. TO DOWNSPOUT.
11. 6" STORM PIPING DOWN FROM ABOVE AND TO B.F.
12. 6" OVERFLOW STORM PIPING FROM ABOVE, OFF-SET A.C. AND DOWN ON WALL TO 12" A.F.G. TO DOWNSPOUT.
13. 6" STORM PIPING DOWN FROM ABOVE, OFF-SET A.C. AND TO B.F.
14. 6" STORM PIPING B.F. TO STORMWATER STORAGE VAULT UNDER COVERED PARKING. SEE CIVIL PLANS FOR MORE INFORMATION ON STORM VAULT.
15. 1/2" COLD WATER DOWN IN WALL AND UP TO ABOVE.

1ST LEVEL FLOOR PLAN - PLUMBING | 01 | 1/8"=1'-0"



2ND LEVEL FLOOR PLAN - PLUMBING | 02 | 1/8"=1'-0"

宋
Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

COCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6281

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

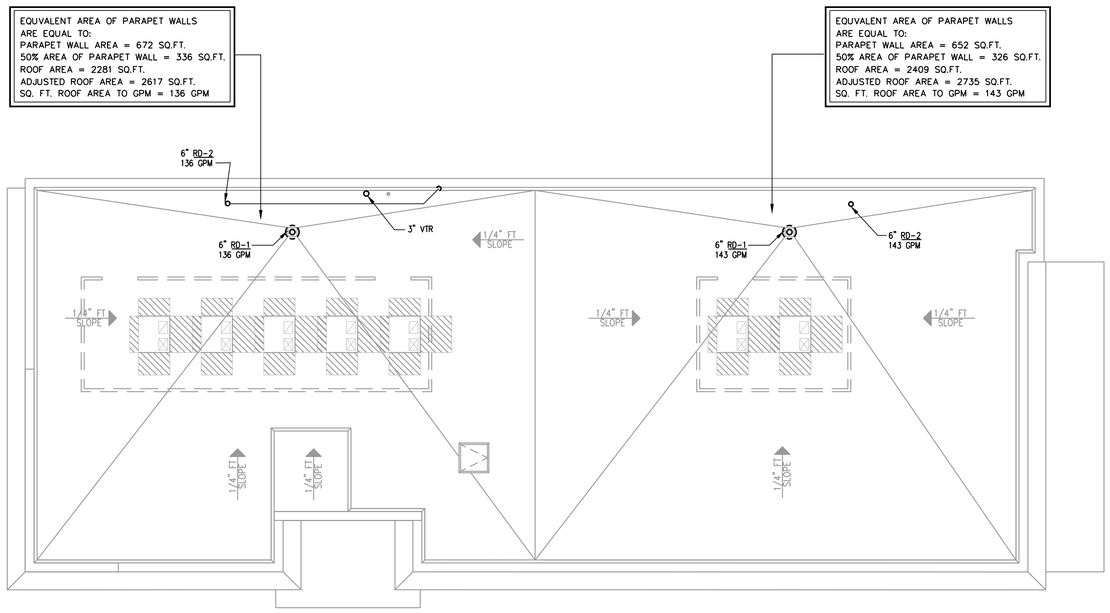
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : GMB
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
1ST & 2ND LEVEL FLOOR PLANS - PLUMBING

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
P101

PRINT DATE: 1/4/2022 1:41 PM - SAVE DATE: 12/17/2021 10:20 AM - FILE LOCATION: K:\19 JOBS\18069 - 95 SW 5TH AVE SHELL BLDG\DWGS\18069-P101.DWG



ROOF PLAN - PLUMBING | 02 | 1/8"=1'-0"

PRINT DATE:1/4/2022 1:42 PM SAVE DATE:12/17/2021 10:19 AM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014P102.DWG

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

OCI CONSULTING ENGINEERS

Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco

2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576

www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : GMB
Checked By : JLS

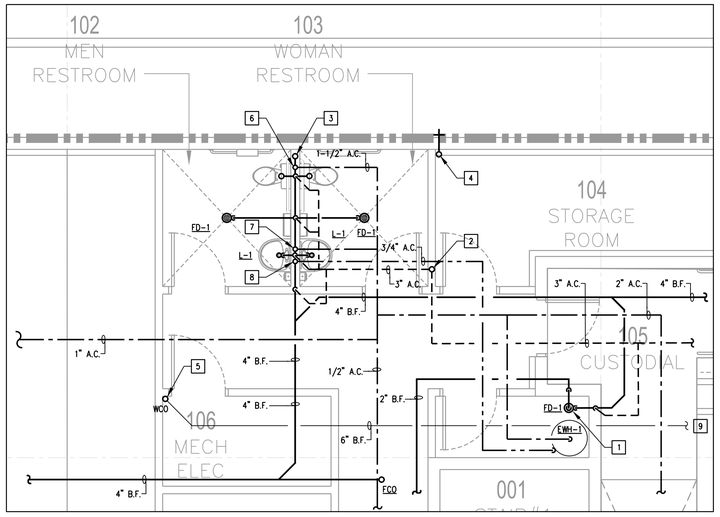
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
ROOF PLANS - PLUMBING

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

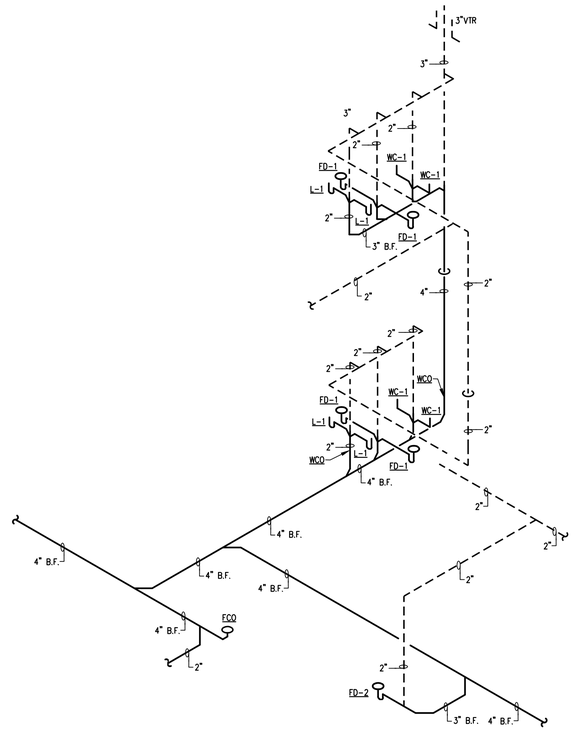
Sheet # :
P102

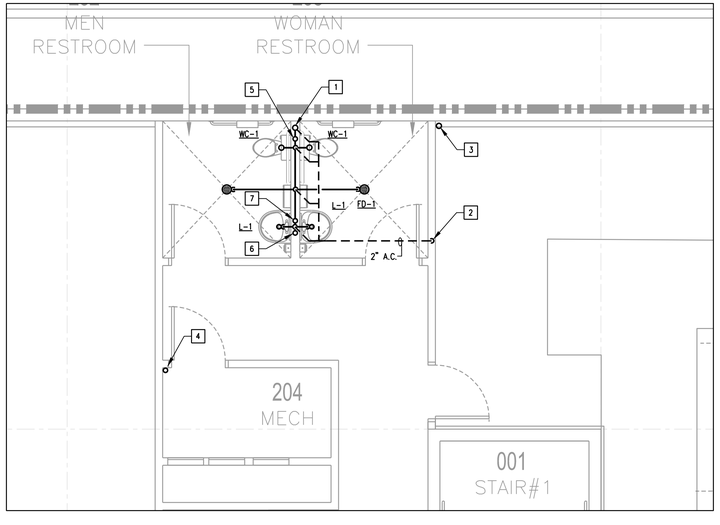


PLUMBING KEYNOTES [X]:

1. 2" PUMPED DISCHARGE FROM ELEVATOR SUMP PUMP TO TERMINATE WITH AIR GAP TO FD-1
2. 2" V.S. UP IN CHASE TO ABOVE.
3. 4" W.S. FROM ABOVE.
4. 6" OVERFLOW STORM PIPING FROM ABOVE, DOWN ON WALL TO 12" A.F.G. TO DOWNSPOUT.
5. 6" STORM PIPING DOWN FROM ABOVE AND TO B.F.
6. 1-1/2" COLD WATER PIPING STACK. SERVICES FOR TWO (2) WATER CLOSETS (WC-1) ON THE 1ST LEVEL AND TWO (2) ON 2ND LEVEL.
7. 3/4" COLD WATER PIPING STACK. SERVICES FOR TWO (2) LAVATORIES (L-1) ON THE 1ST LEVEL AND TWO (2) ON 2ND LEVEL.
8. 3/4" HOT WATER PIPING STACK. SERVICES FOR TWO (2) LAVATORIES (L-1) ON THE 1ST LEVEL AND TWO (2) ON 2ND LEVEL.
9. 6" STORM PIPING ROUTED TO UNDERGROUND STORM VAULT.

ENLARGED 1ST LEVEL RESTROOM PLAN - PLUMBING | 01 | 1/4"=1'-0"

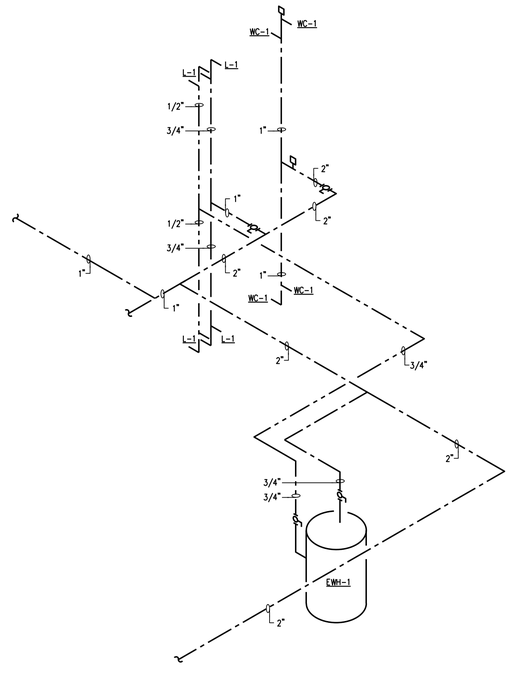




PLUMBING KEYNOTES [X]:

1. 4" W.S. DOWN IN CHASE TO BELOW AND 3" V.S. UP TO 3" VTR
2. 2" V.S. FROM LEVEL BELOW.
3. 6" (136 GPM) AUX STORM PIPING STACK
4. 6" (136 GPM) STORM PIPING STACK.
5. 1" COLD WATER PIPING FROM BELOW, ROUTE AND TIE WATER CLOSETS (WC-1).
6. 1/2" HOT WATER PIPING FROM BELOW, ROUTE AND TIE TO LAVATORIES (L-1).
7. 3/4" COLD WATER PIPING FROM BELOW, ROUTE AND TIE TO LAVATORIES (L-1).
8. 1/2" COLD WATER PIPING FROM BELOW, ROUTE AND TIE TO ELECTRICAL WATER COOLER (EWC-1).

ENLARGED 2ND LEVEL RESTROOM PLAN - PLUMBING | 02 | 1/4"=1'-0"



ISOMETRIC PLANS- PLUMBING | 03 | NTS

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

JASON L. SMITH LICENSE NO. 57743 STATE OF FLORIDA PROFESSIONAL ENGINEER

JASON L. SMITH, P.E.
600 S. ORLANDO AVE.
MAITLAND, FL. 32751
FL. REG. NO.: PE57743

COCI CONSULTING ENGINEERS

Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco

2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576

www.ociassociates.com
Certificate of Authorization #0281

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : GMB
Checked By : JLS
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
PLANS - PLUMBING

This item has been electronically signed and sealed by Jason Smith, PE on 01/05/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Sheet # :
P103

PRINT DATE:1/7/2022 1:42 PM SAVE DATE:12/16/2021 2:15 PM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014P103.DWG

GENERAL NOTES

1. PROVIDE LABOR, MATERIALS, TOOLS, EQUIPMENT AND SERVICES FOR ELECTRICAL WORK INDICATED ON DRAWINGS. PROVIDE ALL ADDITIONAL AUXILIARY EQUIPMENT SUCH AS CONDUIT SUPPORT DEVICES, BOXES, CLAMPS, ETC., NOT SPECIFICALLY SHOWN ON THESE DRAWINGS, BUT NECESSARY FOR A COMPLETE INSTALLATION.
2. ALL PENETRATIONS IN RATED WALLS SHALL BE SEALED WITH UL LISTED FIRE-STOP SEALANT IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND UL ASSEMBLY LISTING. ALL OTHER CONDUIT RUNS FROM EXTERIOR SHALL BE SEALED WITH UL LISTED VAPOR STOP PUTTY.
3. COORDINATE WITH ALL OTHER TRADES PRIOR TO START OF WORK.
4. NEW MATERIALS INSTALLED SHALL CONFORM TO NEMA STANDARDS AND SHALL BEAR THE UL LABEL FOR APPLICATION USED.
5. WHERE NEW CONDUCTORS AND/OR CONDUIT SYSTEM ARE INSTALLED, LENGTH AND ROUTING OF CONDUCTORS AND/OR CONDUIT SYSTEMS SHALL BE DETERMINED IN THE FIELD BY THE ELECTRICAL CONTRACTOR.
6. ALL EMPTY CONDUITS SHALL CONTAIN PULL STRING (200LB TEST). ENDS SHALL BE CAPPED WITHOUT GLUE, TO PREVENT INTRUSION OF FOREIGN MATERIALS.
7. ALL WIRING INSTALLED SHALL BE THHN/THWN/XHHW STRANDED COPPER UNO.
8. EACH BRANCH CIRCUIT SHALL UTILIZE A SEPARATE NEUTRAL CONDUCTOR. MULTI-WIRE BRANCH CIRCUITS WITH COMMON NEUTRAL WIRES SHALL NOT BE USED.
9. UPON COMPLETION OF WORK, MODIFY THE PANEL DIRECTORY OF THE PANEL(S) TO REFLECT THE CORRECT CIRCUITS. ALSO DOCUMENT THE AS-BUILT CONDITIONS ON PLANS. HAND WRITTEN DIRECTORIES ARE NOT ACCEPTABLE.
10. COORDINATE EXACT INSTALLATION REQUIREMENTS OF OUTLETS IN MILLWORK WITH ARCHITECTURAL DRAWINGS AND ACCEPTED MILLWORK SHOP DRAWINGS.
11. LOCATION OF ALL DEVICES ON DRAWINGS ARE APPROXIMATE ONLY. VERIFY EXACT LOCATION WITH OWNERS REPRESENTATIVE, ARCHITECT, AND/OR ENGINEER PRIOR TO ROUGH-IN.
12. COORDINATE THE LOCATION OF VOICE/DATA OUTLETS WITH POWER RECEPTACLES ESPECIALLY WHERE COMPUTERS ARE TO BE LOCATED.
13. ALL RACEWAYS AND CABLE SHALL BE BE CONCEALED UNLESS NOTED OR APPROVED IN WRITING BY OWNER AND/OR ENGINEER.
14. ALL CONTROL WIRING FOR MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR.
15. ALL EXPOSED CONDUITS SUBJECT TO PHYSICAL DAMAGE SHALL BE RIGID GALVANIZED STEEL TYPE.
16. MINIMUM CONDUIT SIZE SHALL BE 3/4" C.
17. MULTIPLE LIGHT SWITCHES, AT THE SAME LOCATION, SHALL BE GANGED TOGETHER UNDER ONE COVER PLATE. DIMMER SWITCHES SHALL BE INSTALLED IMMEDIATELY BELOW SWITCH LOCATIONS.
18. ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL EQUIPMENT PLANS AND ELEVATIONS FOR ALL LOCATIONS. LOCATIONS ARE SHOWN FOR DESIGN PURPOSES ONLY.
19. WHERE CONDUIT ROUTING IS SHOWN, THE CONDUITS ARE SHOWN FOR DIAGRAMMATIC PURPOSES AND ARE NOT NECESSARILY REPRESENTATIVE OF EXACT PLACEMENT.
20. COORDINATE EXACT LOCATION OF EACH LIGHT FIXTURE WITH MECHANICAL PIPING, CONDUIT, HVAC GILLES, ETC. FIELD ADJUST ANY LIGHT TO AVOID CONFLICT.
21. COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATION AND CONNECTION REQUIREMENTS OF EQUIPMENT PRIOR TO ROUGH-IN.
22. WORKING CLEARANCES FOR ELECTRICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH NATIONAL ELECTRICAL CODE ARTICLE 110.
23. BUILDING SHALL HAVE A U.L. MASTER LABEL LIGHTNING PROTECTION SYSTEM. SHOP DRAWINGS SHALL BE ISSUED BY A CERTIFIED LIGHTNING PROTECTION CONTRACTOR AND SHALL BE USED FOR BIDDING PURPOSES.

APPLICABLE CODES:

1. 2020 FLORIDA BUILDING CODE
2. NFPA 70 - 2017 NATIONAL ELECTRICAL CODE
3. NFPA 101 - 2015 LIFE SAFETY CODE

FIXTURE SCHEDULE

TYPE	DESCRIPTION	TOTAL WATTS	LAMPS NO.	LAMPS WATTS	LAMPS TYPE	VOLTAGE	MOUNTING	NOTES
A	4FT STRIP LIGHT CONSTRUCTED FROM COLD ROLLED STEEL WITH POLYESTER POWDER COAT FINISH AND 0-10V DIMMING DRIVER, 4000K CCT. DESIGN SELECTION: HE WILLIAMS 76-4-L53/840-OS-DIM-UNV	34	-	-	LED	120	CHAIN	-
AE	SAME AS FIXTURE TYPE "A" BUT WITH EMERGENCY BATTERY BACK UP. DESIGN SELECTION: HE WILLIAMS 76-4-L53/840-EM/10W-DIM-UNV	34	-	-	LED	120	CHAIN	-
B	2'X2' EDGE LIT FLAT PANEL CONSTRUCTED FROM DIE FORMED ALUMINUM WITH MATTE WHITE POLYESTER POWDER COAT FINISH AND 0-10V DIMMING DRIVER. 4000K CCT. DESIGN SELECTION: HE WILLIAMS : LP-24-L40/835-OPTIONS-DIM-UNV	40	-	-	LED	120	RECESSED	-
BE	SAME AS FIXTURE TYPE "B" BUT WITH EMERGENCY BATTERY BACK UP. DESIGN SELECTION: HE WILLIAMS LP-22-L40/840-EM/10WRM-DIM-UNV	40	-	-	LED	120	RECESSED	-
CE	1'X4' EDGE LIT FLAT PANEL CONSTRUCTED FROM DIE FORMED ALUMINUM WITH MATTE WHITE POLYESTER POWDER COAT FINISH, 0-10V DIMMING DRIVER AND EMERGENCY BATTERY BACKUP. 4000K CCT. DESIGN SELECTION: HE WILLIAMS LP-14-L40/840-EM/10WRM-DIM-UNV	40	-	-	LED	120	RECESSED	-
D	4" ROUND DOWNLIGHT CONSTRUCTED FROM DIE-CAST ALUMINUM WITH ALUMINUM HEAT SINKS, LOW IRIDESCENT ANODIZED ALUMINUM REFLECTORS, AND 0-10V DIMMING DRIVER 3000K CCT. RATED FOR WET LOCATIONS. DESIGN SELECTION: HE WILLIAMS 4DR-TL-L10/830-DIM-UNV-LM-OF-CS-WET/CC-N	9	-	-	LED	120	RECESSED	(3)
DE	SAME AS FIXTURE TYPE "D" BUT WITH EMERGENCY BATTERY BACK UP. DESIGN SELECTION: HE WILLIAMS 4DR-TL-L10/830-EM/7W-DIM-UNV-LM-OF-CS-WET/CC-N	9	-	-	LED	120	RECESSED	(3)
F	4' GASKETED FIXTURE CONSTRUCTED FROM FLAME RATED FIBERGLASS WITH AN INTERNAL ALUMINUM HOUSING WITH STAINLESS STEEL LATCHES, POLYESTER POWDER COAT REFLECTORS, FROSTED RIBBED IMPACT RESISTANT ACRYLIC NON DIMMABLE DRIVER AND EMERGENCY BATTERY BACK UP. 4000K CCT. DESIGN SELECTION: HE WILLIAMS 96-4-L40/840-HIAFR-EM/10W-DRV-UNV	48	-	-	LED	120	SURFACE	-
S	4FT LINEAR LIGHT CONSTRUCTED FROM COLD ROLLED STEEL WITH FROSTED HIGH IMAPCT ACRYLIC LENS, TAMPER RESISTANT SCREWS, INTEGRAL EMERGENCY BATTERY, AND INTEGRAL ULTRA SONIC SENSOR. 4000K CCT. DESIGN SELECTION: HE WILLIAMS SLF-4-L98/840-HIA/TP-EM/10W-DRV-120-OCCWS FS-505-PP-120	75	-	-	LED	120	SURFACE	-
PG	4" ROUND CEILING DOWNLIGHT CONSTRUCTED FROM DIE CAST ALUMINUM WITH CLEAR TEMPERED GLASS LENS, HEAVY GAUGE ALUMINUM REFLECTORS, SILICONE O-RINGS, POLYESTER POWDER COAT FINISH AND 0-10V DIMMING DRIVER. DESIGN SELECTION: LITON DL340-BZ	18	-	-	LED	120	SURFACE	(2)
PGE	SAME AS FIXTURE TYPE "PG" BUT WITH EMERGENCY BATTERY BACK UP. DESIGN SELECTION: LITON DL340-BZ-EMAC	18	-	-	LED	120	SURFACE	(2)
WPA	PYRAMID FIXTURE CONSTRUCTED PRECISION DIE CAST ALUMINUM WITH INTEGRAL HEATSINK, POLYESTER POWDER COAT FINISH, TAMPER RESISTANT SCREWS AND 0-10V DIMMING DRIVER. DESIGN SELECTION: ULTRALIGHTS 18401CS	13	-	-	LED	120	SURFACE	(1)(2)
X	SINGLE SIDED EXIT LIGHT CONSTRUCTED FROM PREMIUM GRADE, ALUMINUM HOUSING WITH UNIVERSAL MOUNTING HARDWARE, TAMPER PROOF SCREWS AND NICKEL CADMIUM BATTERY. UL LISTED FOR DAMP LOCATIONS. DESIGN SELECTION: BEGHELLI LCI-E SA LR 1 W W	3	-	-	LED	120	SURFACE	-
X2	DOUBLE SIDED EXIT LIGHT CONSTRUCTED FROM PREMIUM GRADE, ALUMINUM HOUSING WITH UNIVERSAL MOUNTING HARDWARE, TAMPER PROOF SCREWS AND NICKEL CADMIUM BATTERY. UL LISTED FOR DAMP LOCATIONS. DESIGN SELECTION: BEGHELLI LCI-E SA LR 2 W W	3	-	-	LED	120	SURFACE	-

NOTES:
(1) FINAL SELECTION BY ARCHITECT.
(2) FINISH BY ARCHITECT.
(3) FINAL TRIM AND FLANGE SELECTION BY ARCHITECT.

ELECTRICAL SYMBOL LEGEND

NOTE: THESE ARE STANDARD SYMBOLS AND ALL MAY NOT APPEAR ON THE PROJECT DRAWINGS.

LIGHTING

- FLUORESCENT OR LED STRIP FIXTURE
- 2X2 LUMINAIRE - CEILING MOUNTED
- RECESSED DOWNLIGHT
- SURFACE MOUNTED DOWNLIGHT
- SURFACE WALLPACK FIXTURE
- UNIVERSAL MOUNTING EXIT LIGHTS, SINGLE AND DOUBLE FACED, ARROWS AS SHOWN ON FLOOR PLANS
- WALL MOUNTED EXIT LIGHTS, SINGLE FACED
- EMERGENCY BATTERY PACK, HEADS AS INDICATED

SWITCHES

- $S_{a,b}$ LOWER CASE SUBSCRIPTS INDICATE OUTLET CONTROLLED
- S_* SINGLE POLE SWITCH (UNLESS NOTED BY SUBSCRIPT)
  * (2) DOUBLE POLE
  (3) WAY
  (4) WAY
  (D) DIMMER SWITCH (1500W UNLESS NOTED)
  (T) SINGLE PHASE MOTOR STARTING SWITCH
  (OS) OCCUPANCY SENSOR
  (WP) WEATHER PROOF
  (TS) DIGITAL TIMING SWITCH (4 HOUR MAX)
- OCCUPANCY SENSOR, CEILING MOUNTED
- VACANCY SENSOR, CEILING MOUNTED

CONDUIT AND WIRE

- CONDUIT CONCEALED IN WALLS OR ABOVE CEILINGS
- CONDUIT CONCEALED UNDERGROUND OR IN SLAB
- CONDUIT HOMERUN (SEE SPECIFICATIONS FOR DERATING OF CONDUCTORS BASED ON CIRCUIT LENGTH AND CONDUCTORS IN A CONDUIT)
- PP-1 CIRCUIT DESIGNATION SHALL BE REPRESENTED BY PANEL NAME AND CIRCUIT NUMBER. MULTIPLE POLE CIRCUITS WILL BE REPRESENTED BY CIRCUIT NUMBERS SEPARATED BY A COLON.

FIRE ALARM SYSTEM

NOTE:
(D) DENOTES DUCT MOUNTED
(C) DENOTES CEILING MOUNTED
(WP) DENOTES WEATHERPROTECTED

- FD THERMAL DETECTOR, FIXED + RATE-OF-RISE
- SD SMOKE DETECTOR - PHOTO
- XD CARBON MONOXIDE DETECTOR
- F MANUAL STATION
- CE CONTROL ELEMENT
- FS FLOW SWITCH (FIRE SPRINKLER)
- KB KNOX BOX, MOUNTED AT 7'-0" AFG OR @ HEIGHT INDICATED ON FLOOR PLAN.
- CR CONTROL RELAY
- RT REMOTE TEST INDICATOR
- F SIGNALING HORN WITH VISUAL SIGNAL (STROBE, 75CD UNLESS NOTED)
- FIRE ALARM STROBE, MOUNTED 80" AFF
- FAAP FIRE ALARM ANNUNCIATOR PANEL
- FACP FIRE ALARM CONTROL PANEL
- FATC FIRE ALARM TERMINAL CABINET

RECEPTACLES

- DUPLEX RECEPTACLE
  * (G) DUPLEX GFCI RECEPTACLE
  (EWC) ELECTRIC WATER COOLER. COORDINATE LOCATION WITH PLUMBING INSTALLER. LOCATE GFCI RECEPTACLE CENTERED UP UNDER COOLER.
  (WPG) DUPLEX GFCI WEATHER RESISTANT RECEPTACLE, WEATHERPROOF COVER
- DUPLEX RECEPTACLE FLUSH MOUNTED IN CEILING
- 5-20R SPECIAL OUTLET, SUBSCRIPT INDICATES NEMA CONFIGURATION NUMBER

POWER CONNECTIONS

- J JUNCTION BOX SIZED PER N.E.C. UNLESS NOTED
  * (ZD) ELECTRICAL CONNECTION FOR HVAC EQUIPMENT MOUNTED ABOVE CEILING
  (VVT) ELECTRICAL CONNECTION FOR HVAC EQUIPMENT MOUNTED ABOVE CEILING
  (VAV) ELECTRICAL CONNECTION FOR HVAC EQUIPMENT MOUNTED ABOVE CEILING
- SH WALL MOUNTED SHUNT TRIP STATION MOUNT AT 7'-0" AFG FOR OUTDOOR INSTALLATIONS AND 4'-0" AFF FOR INDOOR INSTALLATIONS.
- PE PHOTO-ELECTRIC CELL
- EWH ELECTRIC WATER HEATER
- IWH INSTANTANEOUS WATER HEATER
- EF M MOTOR CONNECTION, MARK NUMBER WILL IDENTIFY EQUIPMENT, EF, AHU, CU, ETC. SEE MOTOR CONNECTION SCHEDULE.
- 30/3 NON FUSIBLE HEAVY DUTY SAFETY SWITCH, SIZE AND NUMBER OF POLES ARE INDICATED.
- 30/3 / 25 SR FUSIBLE HEAVY DUTY SAFETY SWITCH, SIZE AND NUMBER OF POLES ARE INDICATED.
  ENCLOSURE NEMA RATING
  DISCONNECT SIZE, #POLES
  FUSE SIZE
- * COMBINATION MAGNETIC STARTER WITH FUSIBLE HEAVY DUTY SAFETY SWITCH.
  * (VFD) PROVIDE WITH VARIABLE FREQUENCY DRIVE CONTROLLER COMPATIBLE WITH VARIABLE FREQUENCY DRIVE.
- ENCLOSED CIRCUIT BREAKER.
- PANELBOARD, LOW VOLTAGE (120/208V) - SEE PANELBOARD SCHEDULES AND RISER DIAGRAM
- PANELBOARD, HIGH VOLTAGE (277/480V) - SEE PANELBOARD SCHEDULES AND RISER DIAGRAM
- M POWER COMPANY METERING.
- POWER COMPANY METERING.

SITE

- T POWER COMPANY TRANSFORMER - UNLESS NOTED
- PARKING LOT OR ROADWAY HID FIXTURE - NORMAL POWER
- PARKING LOT OR ROADWAY HID FIXTURE - EMERGENCY POWER (VERIFY BRANCH OF ESSENTIAL ELECTRICAL SYSTEM WITH DRAWINGS)
- WALKWAY BOLLARD
- FLOODLIGHT
- POLE

LIGHTNING PROTECTION SYSTEM

- C COUNTERPOISE CONDUCTOR - CABLE SIZED PER NFPA 780
- G MAIN L.P. CONDUCTOR - CABLE SIZED PER NFPA 780
- B BONDING CONDUCTOR - CABLE SIZED PER NFPA 780
- AIR TERMINAL
  * (A) FLAT SURFACE BASE
  (B) FLAT WALL MOUNTED PARAPET
  (C) SWIVEL BASE
  (D) RIDGE SADDLE BASE (EXPOSED)
  (E) RIDGE SADDLE BASE (CONSEALED)
  (F) CONSEALED AIR TERMINAL BASE ASSEMBLY
- MECHANICAL OR EXOTHERMIC BOND
- EXOTHERMIC TEE CONNECTION
- DN DOWN CONDUCTOR LOCATION

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.occiassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

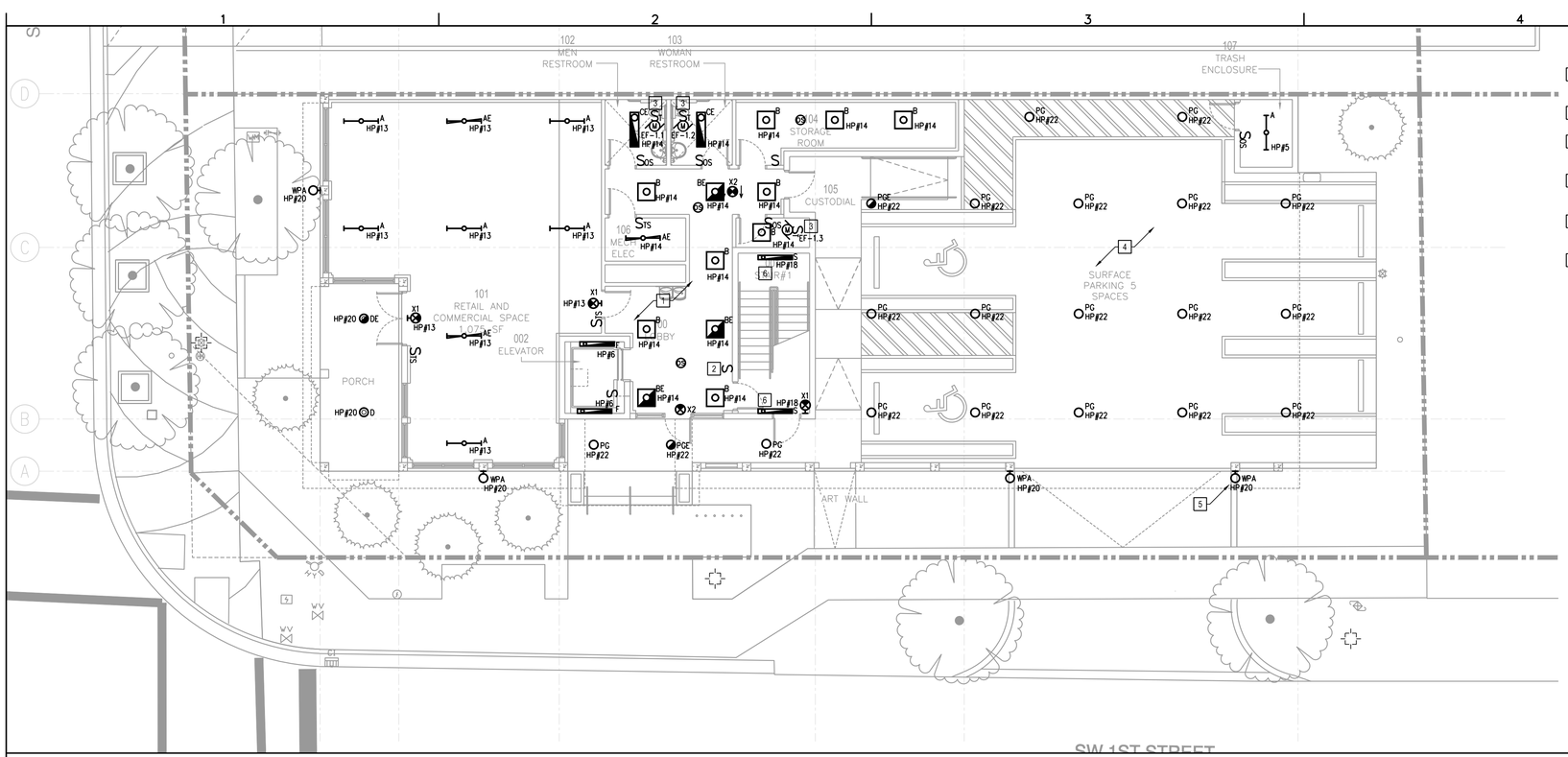
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
GENERAL NOTES AND SYMBOL LEGEND- ELECTRICAL

Sheet # :
E001

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.
Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

PRINT DATE:1/4/2022 1:23 PM SAVE DATE:12/17/2021 8:30 AM FILE LOCATION:c:\19 ARBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E001.DWG



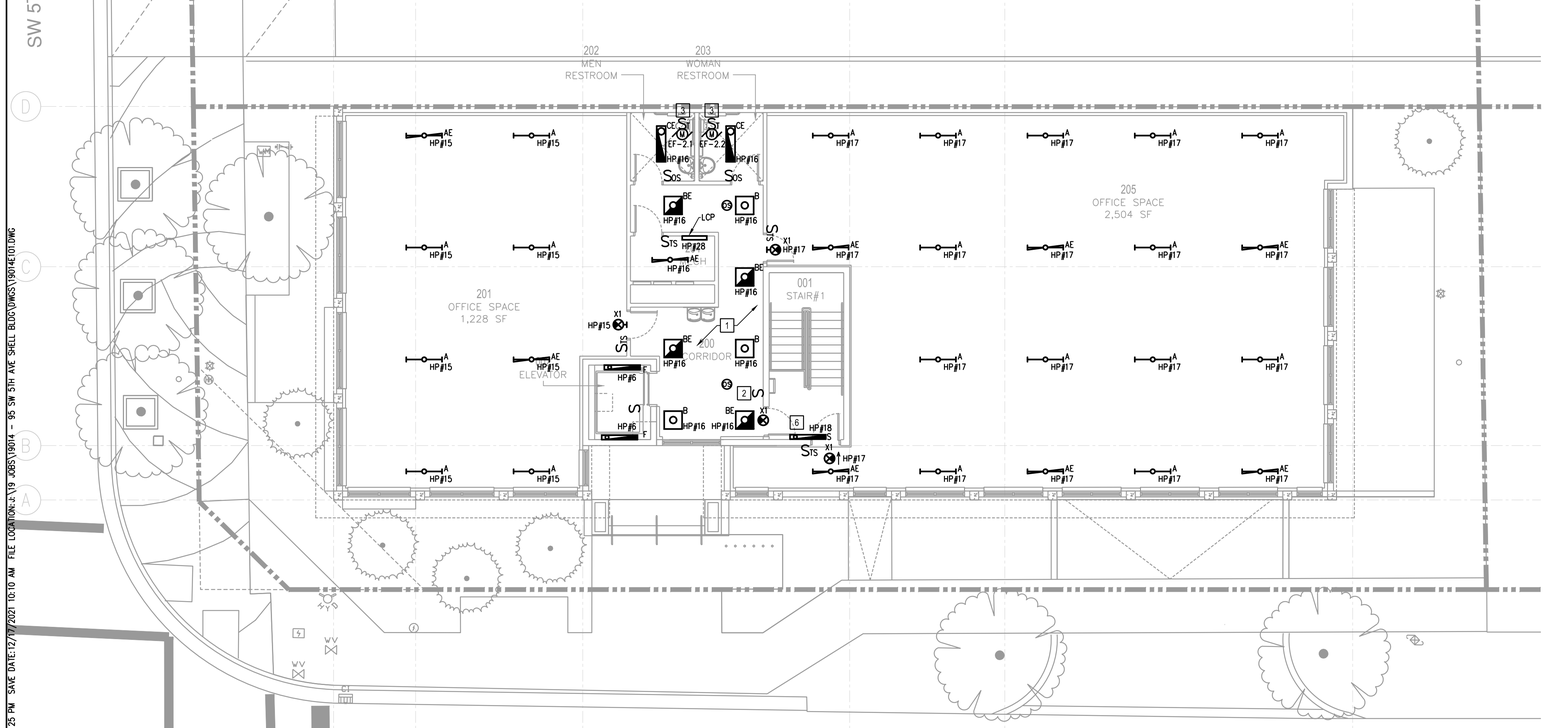
KEYNOTES [X]:

1. INTERIOR CORRIDOR LIGHTING CONTROLLED VIA OCCUPANCY SENSOR. COORDINATE ADDITIONAL CONNECTION REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.
2. OCCUPANCY SENSOR OVERRIDE SWITCH. COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
3. INTERLOCK EXHAUST FAN OPERATION WITH OCCUPANCY SENSOR. COORDINATE FINAL CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
4. PARKING GARAGE LIGHTING CONTROLLED VIA TIME CLOCK-PHOTOCELL COMBINATION AND CONTACTOR PANEL. REFER TO SHEET E601 FOR ADDITIONAL INFORMATION. (TYPICAL)
5. WALL PACK LIGHTING CONTROLLED VIA TIME CLOCK-PHOTOCELL COMBINATION AND CONTACTOR PANEL. REFER TO SHEET E601 FOR ADDITIONAL INFORMATION. (TYPICAL)
6. STAIRWELL LIGHTING CONTROLLED VIA LIGHT FIXTURE WITH INTEGRAL OCCUPANCY SENSOR. REFER TO FIXTURE SCHEDULE ON SHEET E001 FOR ADDITIONAL INFORMATION.

LIGHTING GENERAL NOTES:

1. COORDINATE EXACT LOCATION OF EACH LIGHT FIXTURE WITH MECHANICAL PIPING, CONDUIT, HVAC GILLES, ETC. FIELD ADJUST ANY LIGHT TO AVOID CONFLICT.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT TYPE AND HEIGHT OF CEILING IN EACH ROOM. COORDINATE WITH ARCHITECT/ENGINEER PRIOR TO ROUGH-IN OF ANY FIXTURES. COORDINATE ALL CONTROL JOINT LOCATIONS WITH LIGHT FIXTURES PRIOR TO ANY ROUGH-IN OF FIXTURES.
3. EXIT LIGHTS SHALL BE MOUNTED WITH BOTTOM OF FIXTURE AT 6" ABOVE DOOR HEADER IN ALL AREAS THAT PERMIT THIS PLACEMENT. ALL OTHERS MAY BE CEILING MOUNTED.
4. COORDINATE LOCATION OF ALL LIGHT FIXTURES WITH ARCHITECTURAL INTERIOR AND EXTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
5. LIGHTING FIXTURE CONTROL WITH OCCUPANCY SENSORS/PHOTOCELLS, ETC. SHOWN ON DRAWINGS ARE DIAGRAMMATIC. LIGHTING CONTROL SYSTEM PHOTOCELLS, OCCUPANCY SENSORS, WALL SWITCHES, POWER SUPPLIES (NOT SHOWN), ETC., SHALL BE COORDINATED WITH LIGHTING CONTROLS MANUFACTURER'S SHOP DRAWINGS. INDICATED QUANTITIES, TYPE, AND LOCATION OF DEVICES SHOWN ON LIGHTING CONTROLS MANUFACTURER'S SHOP DRAWINGS SHALL SUPERCEDE DEVICES INDICATED ON THIS DRAWING.

1ST LEVEL FLOOR PLAN - LIGHTING | 01 | 1/8"=1'-0"



2ND LEVEL FLOOR PLAN - LIGHTING | 02 | 1/8"=1'-0"

PRINT DATE:1/4/2022 1:25 PM SAVE DATE:12/17/2021 10:10 AM FILE LOCATION:C:\19 JOBS\18014 - 95 SW 5TH AVE SHELL BLDG\DWGS\18014E101.DWG

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA, LICENSE NO. 63143 ★ STATE OF FLORIDA ★ PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

COCI CONSULTING ENGINEERS

Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco

2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6570 Fax: (561) 688-6576

www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW

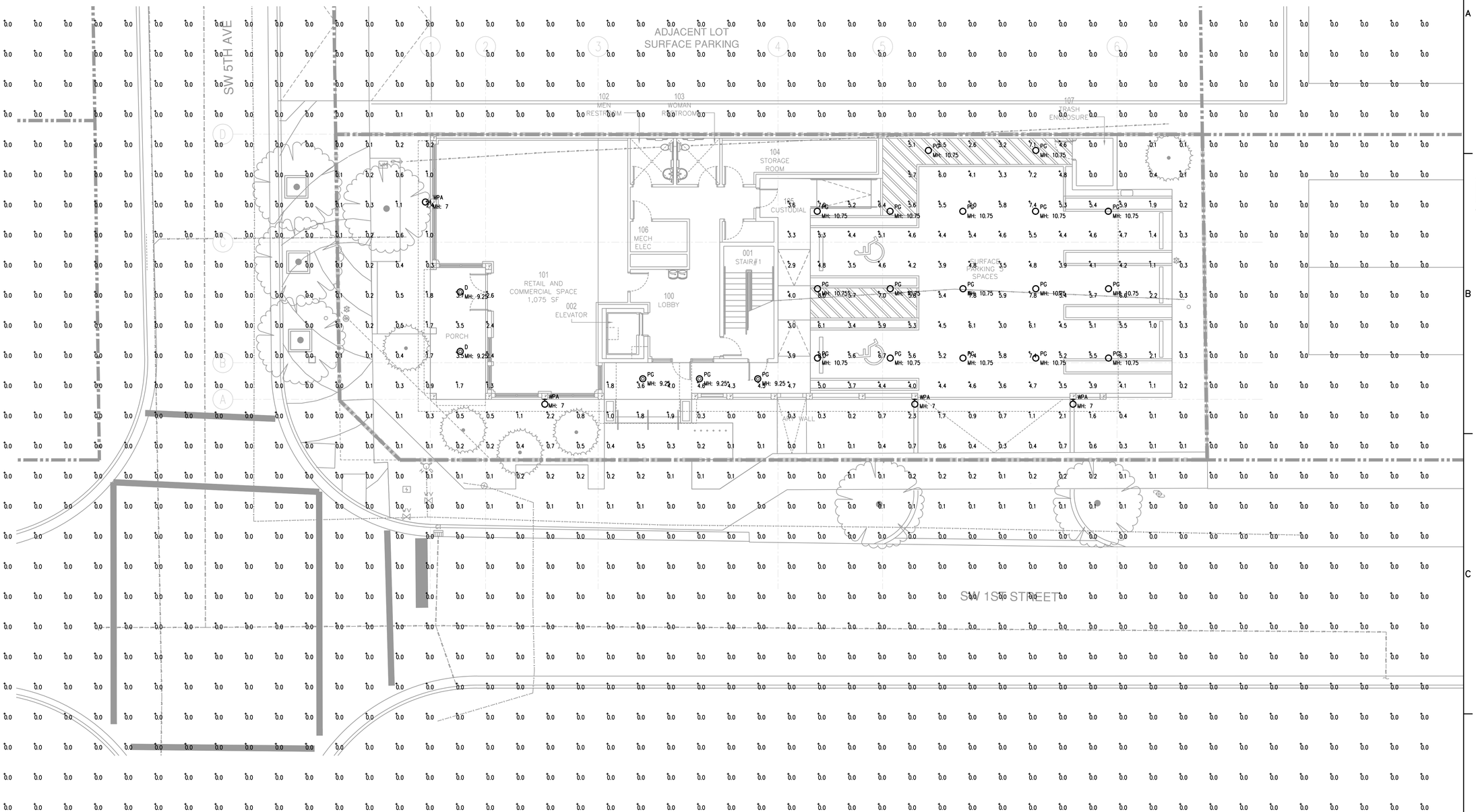
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR PLANS - LIGHTING

Sheet # :
E101

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.



Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE	Illuminance	Fc	0.41	8.0	0.0	N.A.	N.A.
EAST PROPERTY LINE	Illuminance	Fc	0.00	0.1	0.0	N.A.	N.A.
PARKING	Illuminance	Fc	4.89	8.0	1.0	4.89	8.00

Luminaire Schedule				
Symbol	Qty	LLF	Description	Tag
◎	5	0.900	V4DR-L1G-830-DIM-UNV-RW-OF-WH-WET-CC	D
○	17	0.900	DL340BUE-DUN	PG
⊙	4	0.900	18400CS	WPA

PRINT DATE: 1/4/2022 1:26 PM SAVE DATE: 12/17/2021 10:11 AM FILE LOCATION: C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E01A.DWG

SITE PLAN - PHOTOMETRICS | 01 | 1/8"=1'-0"

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.
Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in whole or in part on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

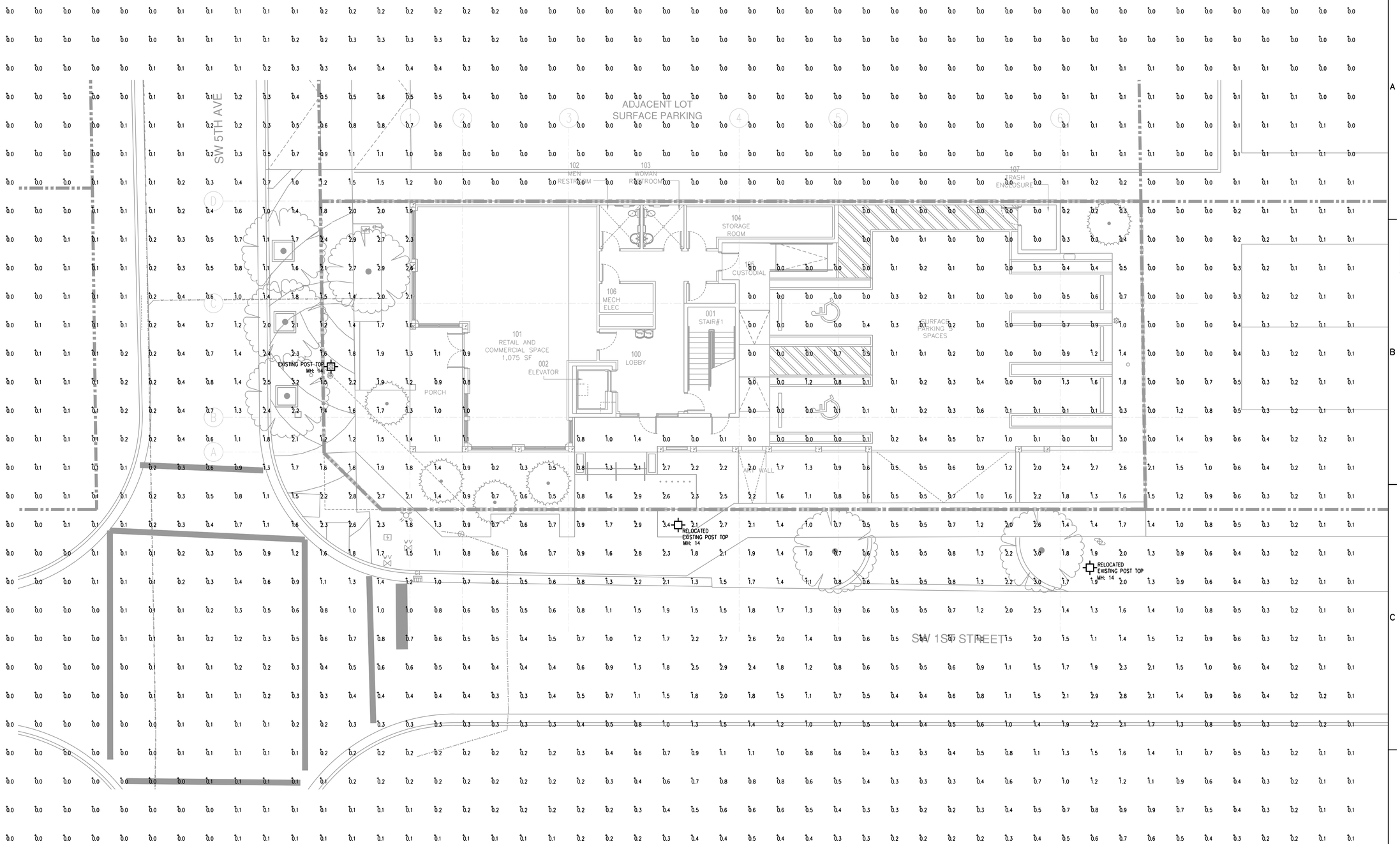
Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
SITE PLAN - PHOTOMETRICS

Sheet # :
E101A



Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE	Illuminance	Fc	0.49	3.4	0.0	N.A.	N.A.
EAST PROPERTY LINE	Illuminance	Fc	0.40	2.1	0.0	N.A.	N.A.
PARKING	Illuminance	Fc	0.20	1.6	0.0	N.A.	N.A.

Luminaire Schedule				
Symbol	Qty	LLF	Description	Tag
⌖	3	0.900	DLR-LE095-2G2-40-CR3-QR18	EX PT

PRINT DATE: 1/4/2022 1:29 PM SAVE DATE: 12/17/2021 9:54 AM FILE LOCATION: c:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E101B.DWG

EXISTING POST TOP - PHOTOMETRICS | 01 | 1/8"=1'-0"

This item has been electronically signed and sealed by Sudharma Wijeguna wardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in connection with any projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

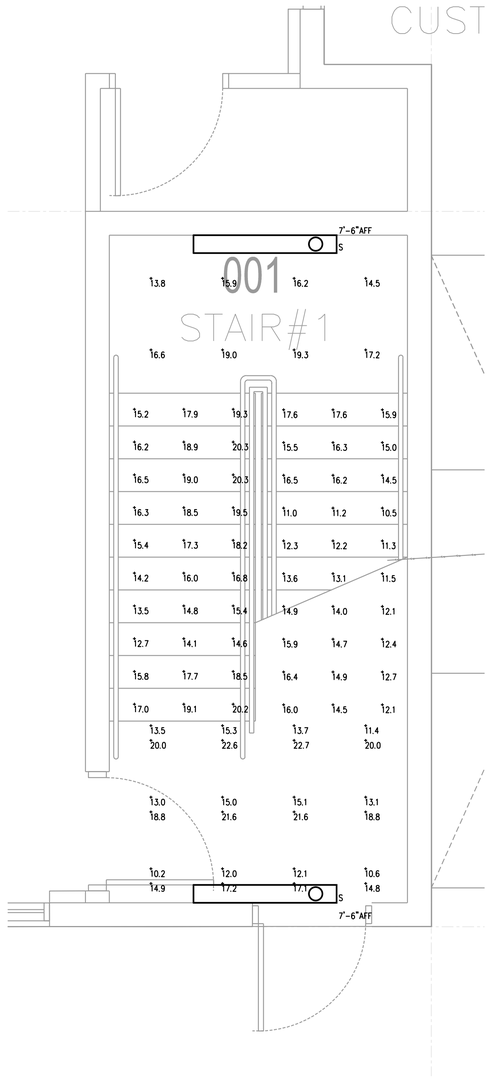
Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
EXISTING POST TOP - PHOTOMETRICS

Sheet # :
E101B



Luminaire Schedule				
Symbol	Qty	LLF	Description	Tag
	3	0.900	SLF-4-L52-840-HIA-DIM-UNV WITH FROSTED ACRYLIC LENS	S

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
BOTTOM LANDING	Illuminance	Fc	12.92	15.3	10.2	1.27	1.50
BOTTOM STEPS	Illuminance	Fc	14.08	17.6	10.5	1.34	1.68
MIDDLE LANDING	Illuminance	Fc	16.56	19.3	13.8	1.20	1.40
TOP LANDING	Illuminance	Fc	19.18	22.7	14.8	1.30	1.53
TOP STEPS	Illuminance	Fc	16.97	20.3	12.7	1.34	1.60

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
STAIRWELL - PHOTOMETRICS

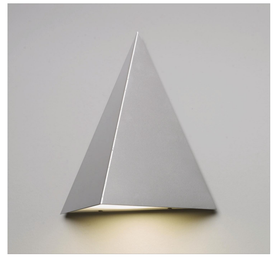
Sheet # :
E101C

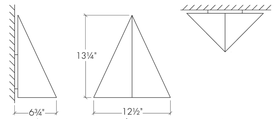
This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

ULTRALIGHTS

WPA





FORTIS 18401

Dark Sky · Wet Location

Base Specifications:
13.25"h x 12.5"w x 6.75"d
02: Wet Loc LED - 16.8W (Std phase dim)
Opal Acrylic Diffuser
Dark Sky

Notes:
02 / 04 Lamping: Wattage and Lumens - Initial at the source

18401	-		-		-	
MODEL		FINISH		DIFFUSER		LAMPING

Modifications:

BA - Bronze Age
BK - Black
BP - Black Pearl
CB - Cast Bronze
CH - Chestnut
CR - Chrome
DI - Dark Iron
EB - Empire Bronze
MB - Medieval Bronze
NB - New Brass
SB - Smokey Brass
SP - Satin Pewter
SS - Smoked Silver

PREMIUM
RCU - Raw Copper Unfinished

OA - Opal

02: Wet Loc LED - 16.8W - 2362 Lumens
☐ (Dim w/ Std Phase Dim) - 120V
☐ (Non-Dim or Dim w/ 0-10V Dim system) Universal
04: Dry / Damp LED - 16.8W - 2362 Lumens
(Non-Dim or Dim w/ 0-10V Dim system) - Universal

COLOR TEMPERATURE / CRI

- ☐ 3000K (Standard) - CRI available upon request
- ☐ 2700K - CRI available upon request
- ☐ 3500K - CRI available upon request
- ☐ 4000K - CRI available upon request

Project Name:
Project Location:

Specifier Name:
Specifier Location:

Quantity:
Fixture Type:

WWW.ULTRALIGHTSLIGHTING.COM

320 S Plumer Avenue • Tucson, AZ 85719 • p +1 520 623 9829 • info@ultralightslighting.com

SLF LED Surface or Wall Mount Light

Williams

CATALOG #:
TYPE: S
PROJECT:

FEATURES

- Sleek design for direct lighting in stairwells and hallways
- Maximize energy savings with efficacies up to 142 lm/W
- Optional end- or side-mount occupancy sensors provide added energy-efficiency
- Attractive, high-impact frosted acrylic lens
- Heavy-duty 16-gauge C.R.S. spot-welded housing
- Multiple dimming protocols available
- Optional tamper-resistant screws for vandal-prone areas
- Made Right Here® in the USA

SPECIFICATIONS

- HOUSING – 16-gauge C.R.S.
- SHIELDING – Frosted high-impact acrylic lens, .100" thick.
- FINISH – 92% minimum average reflective white polyester powder coat bonded to phosphate-free, multi-stage pretreated metal. All parts painted after fabrication to facilitate installation, increase efficiency, and inhibit corrosion.
- ELECTRICAL – High quality mid-power LED board. Rated for 50,000 hours at 70% lumen maintenance (L70), 25°C maximum ambient operating temperature.
- MOUNTING – Wall and surface mount.
- LISTINGS –
  - cETLus conforms to UL STD 1598 and UL STD 8750. Certified to CAN/CSA STD C22.2 No. 250.0. Suitable for damp locations.
  - DesignLights Consortium qualified product. Not all versions of this product may be DLC qualified, see the DLC Qualified Products List at www.designlights.org/QPL.
- WARRANTY – 5-year limited warranty, see hew.com/warranty.

DLC PREMIUM

ORDERING EXAMPLE: SLF - 4 - L98/835 - HIA - OPTIONS - DIM - UNV

ORDERING INFO

SERIES	LENGTH	LUMENS [1]	CRI	CCT	SHIELDING
SLF	2 2'	2'	8 80	27 2700K	HIA Frosted high-impact acrylic, lens secured with Phillips head screws.
	4 4'	L13 1,300lm	9 90 [2]	30 3000K	HIA/TP Frosted high-impact acrylic with tamper resistant screws. [3]
		L26 2,600lm		35 3500K	
		L45 4,500lm		40 4000K	
		4'		50 5000K	
		L26 2,600lm			
		L52 5,200lm			
		L98 9,800lm			

OPTIONS [4]		CONTROL [5]		VOLTAGE
EM/10W	10-watt emergency battery [6]	DIM	Dimming driver	120 120V
EM/10WRM (L___)	Remote mount 10-watt emergency battery [7] Additional lower lumen packages available. [8] Example: 8,000 lumens = SLF-4-L98/835-(L80)	DRV	Non-dimming driver	277 277V
		SD40	Step-dimming driver, 40% light output [17]	UNV 120-277V
PSBR/120	Single-circuit bottom-mounted pull switch on right [9]	SD50	Step-dimming driver, 50% light output [18]	347 347V [19]
PSBL/120	Single-circuit bottom-mounted pull switch on left [10]	VRF/DSR	Lutron Vive integral fixture control, RF only (DFCS)-OEM-RF) and sensor-ready driver	
OCCUPANCY SENSORS [11]				
Passive Infrared (PIR):				
OCCSS SBR-10-___	Line voltage, end mount [12]			
OCCSS SBR-10-D-___	0-10 VDC dimming, end mount [13]			
OCCWS FSP-311-L_-___	Digital high/low, side mount, 120V or 277V [14]			
OCCWS FSP-321-L_-120-480	Digital high/low, side mount, 120V – 480V [15]			
Ultrasonic:				
OCCWS FS-505-PP-___	Low voltage, side mount [16]			

ACCESSORIES

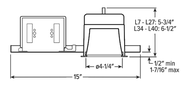
TPSN-8 TOOL #3, tamper-resistant snake eyes tool [20]

NOTES

1 Lumen output based on CCT. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA. Additional lumen packages available, see Options.
2 Extended lead times may apply. Consult factory for availability.
3 Tamper-resistant (TPSN-8) tool is required with HIA/TP option, must be ordered separately, see Accessories.
4 See page 3 for FINISH OPTIONS.
5 See page 2 for ADDITIONAL CONTROL OPTIONS.
6 4' only.
7 2' only.
8 Specify in increments of 100 nominal lumens. Option must be specified with next higher lumen package.
9 120V only.
10 120V only.
11 Factory-installed. See page 3 for OCCUPANCY SENSORS DETAILS.
12 Must specify 120V, 277V or 480V.
13 Must specify 120V, 277V or 480V.
14 Must specify lens L2, L3, or L7. Must specify 120V or 277V.
15 Must specify lens L2, L3, or L7.
16 Must specify 120V, 277V or 347V.
17 When specified with occupancy sensor option, one leg of the driver will be tied to the sensor by default.
18 When specified with occupancy sensor option, one leg of the driver will be tied to the sensor by default.
19 Not available with EM drivers.
20 Required with HIA/TP Shielding. Tamper-resistant tool must be ordered separately. Please specify quantity required per project.

V4DR LED 4.5" Vandal-Resistant Downlight – Round

Williams



CATALOG #:
TYPE: DL2
PROJECT:

FEATURES

- Ideal for schools, hallways, dormitories, locker rooms, or other vandal prone areas
- Beam angles ranging from 25° narrow to 50° wide for tailored performance
- 4 inch aperture is unobtrusive in small scale spaces
- Die cast trim choices include flush, regressed or angled lens
- Industry-leading efficacies as high as 100 lm/W
- Contemporary design provides glare-free illumination for a soft ceiling appearance
- Easily adjust mounting arms below ceiling to adapt to a range of ceiling thicknesses

SPECIFICATIONS

- HOUSING – Die-cast aluminum trim housing with forged aluminum heat sink. Galvanized steel splice compartment with driver mounting plate/enclosure. Swing-out mounting arms adjust for ceiling thickness from 1/2" - 1.1/16" (see options for additional ceiling thicknesses).
- LENSED TRIM – Die-cast aluminum frame with micro-prismatic, polycarbonate lens. Trim is secured with four stainless steel, tamper-resistant screws.
- ELECTRICAL – High-performance Class 2 C.O.B. LED array. Modular quick-connect plug for easy field-connection of LED light assembly to driver. Reported L70=55,000 hours. Reported L90=55,000 hours. Estimated L70 = 200,000 hours.
- MOUNTING – Recessed. 20 ga. galvanized steel mounting pan for new construction or IC-rated enclosure. Minimum 24" O.C. marked spacing required for L34 and L40 lumen packages.
- LISTINGS –
  - cSAus conforms to UL STD 1598; Certified to CAN/CSA STD C22.2 No. 250.0 for damp locations. LED light assembly conforms to UL 2108 for remote installation.
  - Suitable for wet location under covered ceiling when specified with WET/CC option.
  - IC-rated for direct contact with insulation when specified with I Mounting Type.
  - City of Chicago Environmental Air approved when specified with CP option.
  - Complies with ASTM-E283 when specified with ATH option.
  - RoHS compliant.
- WARRANTY – 5-year limited warranty, see hew.com/warranty.

ORDERING EXAMPLE: V4DR - L14/835 - OPTIONS - DIM - UNV - LW - OF - WH - TRIM OPTIONS - N - FL (HOUSING · TRIM · MOUNT)

HOUSING

SERIES	LUMENS [1]	CRI	CCT	OPTIONS	CONTROL [2]	VOLTAGE
V4DR	L7 700lm [3]	8 80	27 2700K	ATH Airtight construction	DIM Dimming driver, 0-10V	UNV 120-277V
	L10 1,000lm	9 90 [4]	30 3000K	F Fuse	DIM1 1% Dimming driver, 0-10V	347 347V [19]
	L14 1,400lm		35 3500K	EM/7W 7-watt emergency battery [5]		
	L20 2,000lm		40 4000K	EM/10W 10-watt emergency battery [6]		
	L27 2,700lm		50 5000K	CP Chicago plenum (CCEA) [7]		
	L34 3,400lm			SDT Stepdown transformer [8]		
	L40 4,000lm			TC Adjustable mounting arms for 1-1/2" – 2-1/4" thick ceilings		
				TP10 T10 torx bit 1/4" drive tamper-resistant tool [9]		

TRIM

TRIM TYPE	DISTRIBUTION [11]	FLANGE TYPE	REFLECTOR FINISH	TRIM OPTIONS
L Flush lens	W Wide	OF 1/2" standard flange	WH White texture powder coat	MWT Textured white trim flange [12]
R Regressed lens	50° Flush		CS Clear semi-specular powder coat	IP IP65 rated trim
A Angled lens [10]	50° Regressed		BL Black texture powder coat	PO Diffuse 1/8" polycarbonate lens [18]
	M Medium [13]		MB Black texture splay with white flange [14]	WET/CC Wet location, covered ceiling listed
	35° Flush			AM Anti-microbial [15]
	30° Regressed			
	N Narrow [16]			
	25° Flush			
	25° Regressed			
	WW Wall wash [17]			

MOUNTING

MOUNTING TYPE [20]	MOUNTING HARDWARE [21]
N Open pan for new construction	F1 Integral 2-position fixed pan bracket, universal bar hanger included [22]
I IC-rated enclosure for new construction [22]	BA1 Adjustable butterfly pan bracket, bar hanger not included [24]
	CA1 Adjustable caterpillar pan bracket, universal bar hanger included [25]

NOTES

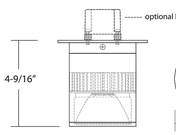
1 Lumen output based on L trim type, W distribution and WH finish, 3500K/80CRI. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA.
2 See page 3 for ADDITIONAL CONTROL OPTIONS.
3 Not available with EM/10W emergency batteries.
4 Extended lead times may apply. Consult factory for availability.
5 N Mounting Type only.
6 N Mounting Type only.
7 I Mounting Type required.
8 May be required for 347V, see product builder at hew.com/product-builder
9 Tamper-resistant (TP10) tool must be ordered separately. Please specify quantity required per project.
10 Not available with EM batteries or DMX controls.
11 Beam angle based on WH reflector finish.
12 Available with WW Distribution only.
13 Not available with lumen stops L34 and higher when specified with flush or regressed trim types.
14 Not available with lumen stops L34 and higher when specified with flush or regressed trim types.
15 A Trim Type only.
16 R Trim Type only. Not available with MWT.
17 Not available with WH Reflector Finish or L Trim Type.
18 W distribution only.
19 WH and BL Reflector Finishes only.
20 Mounting hardware required, ordered separately, see MOUNTING HARDWARE ordering info. See page 4 for MOUNTING TYPE DETAILS.
21 Additional mounting hardware options available. See page 5 for MOUNTING HARDWARE DETAILS.
22 L14 lumen package max. L20 available, W distribution only.
23 I Mounting requires external brackets.
24 N Mounting Type only.
25 N Mounting Type only.

LITON

TYPE PG PROJECT
CATALOG#

DL340 - 4" ROUND CEILING DOWNLIGHT (IP65) - 1000LM/1500LM

SURFACE CEILING OR PENDANT MOUNT



SPECIFICATION

Application: This DL Series covered ceiling mount down light can be used in both interior and outdoor settings. Typical locations are in commercial and retail spaces that require lighting from above. Dark Sky compliant.

Housing: Constructed from a round one piece high grade aluminum extrusion, die cast aluminum top plate, and faceplate with a powder coat finish. Includes COB LED, reflector, LED driver and a mounting plate. Top plate is secured to housing by threads. Mounting plate is secured to top plate with two (2) flat head phillips stainless steel screws and installs onto an electrical junction box. Consult factory for junction box mounting sizes.

Mounting: Fixture includes a mounting bracket for installation directly to a 3-1/2" or 4" octagonal electrical junction box. Can also be mounted as a 12" - 48" pendant (EPCMD4).

Faceplate: Round one piece extruded aluminum with powder coat finish, clear tempered glass lens, and silicone o-ring. Faceplate is secured to the housing by threads.

Reflector Construction: One piece, heavy-gauge aluminum reflector prevents ugly dents during shipping and installation. Deeply mounted singular LED provides 50 degree visual cutoff for a glare-free appearance.

Lumen Maintenance: Minimum 50,000 hours L70 life based on ANSI TM-21 calculations from LM80 standardized test results. See ordering guide for delivered lumens.

Dimming: (UE-DUN) UniDim™ dimming option is a universal dimming system that works with most 120V, 3-wire ELV, 2-wire incandescent and 120V/277V, 5-wire 0-10V fluorescent dimmers. (UE-D10) 0-10V dimming works with most 5-wire, 0-10V dimmers. Factory qualified for use with Leviton IP710-DLZ. (-DIN) dimming option smoothly dims down to 5% of initial light output with flicker-free performance. Works with standard 120V incandescent dimmers.

Electrical: AC 50/60Hz Electronic Direct Current Class 2 driver integrally mounted. Power Factor > 0.90. For cold weather applications (-22°C and above) use -DUN driver option.

Emergency Options: Emergency LED Battery Back-up available, remotely mounted adjacent to housing in junction box. When AC power fails, the device immediately switches to the emergency mode, operating the LEDs for a minimum of 90 minutes. Remote test switch and plate cover included. (-EMAC) is not wet location rated, and must be mounted in a dry area.

Caution: LITON recommends use of surge protectors on the power entering LED Housings. Surge damage is not covered by warranty.

Warranty: Covered by a 5 Year Warranty to be free of defects in materials and craftsmanship. Fixture should not be installed in applications with ambient temperature above 60 degrees C. Doing so will result in reduced lamp life and voided warranty.

Note: Dark Sky compliant.

Listing: ETL / cETL Listed. Suitable for wet location. Assembled in USA. (IP65).

Finish: A 7-stage electrostatic, polymer process provides a finish that delivers outstanding durability, superior anti-aging, resistance to corrosion and UV-degradation Standard finishes are White, Silver, Basic Bronze, Black. Special order finishes are Light Silver*, Dark Grey*, Metallic Gold* and Metallic Black*.

Beam Spread: Available in Wide Flood, 2° Pencil Beam, Narrow Spot, Spot, Flood and Wall Wash Optic.

LED: Energy efficient Chip-On-Board (COB) Singular LED Light Source provides for smooth uniform light output, eliminating the multiple shadow effect seen by multiple LED Source products. Binned with 4-step MacAdam ellipses as recommended by ANSI standard (-MAC). Available in 4000K, 1700K*, 2700K, 2700K 97CRI*, 3000K, 3000K 97CRI*, 3500K, and 5000K.

Benefit
- Energy efficient, low glare LED Chip-On-Board light engine
- Beam spreads include NS, SP, FL, WFL and 2° Pencil Beam
- Emergency back up available
- Singular COB Light Source
- 5 year limited warranty

2021.05.06

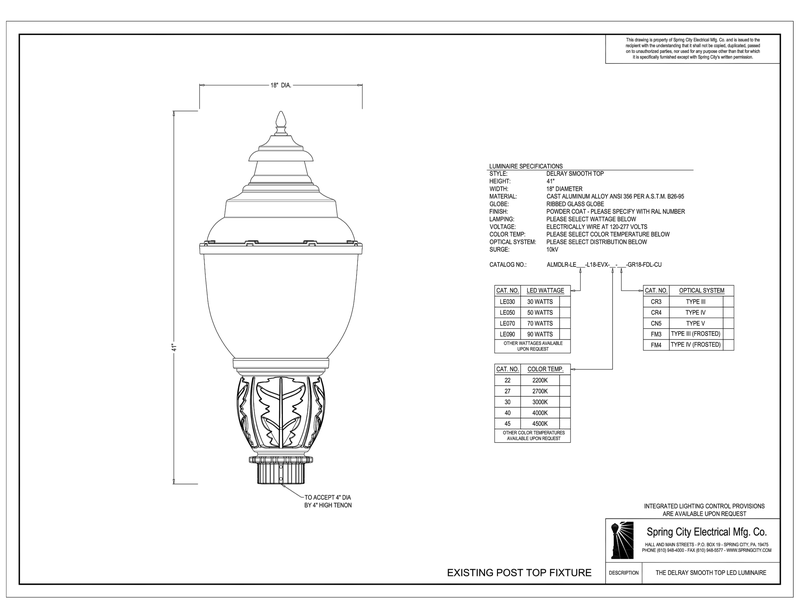
FEATURE:

ORDERING EXAMPLE : DL340B-L15-820-T17

DL340	FINISH	LUMEN	BEAM SPREAD	DIMMING	LED	OPTIONS
DL340	W White	Blank 1000lm (15W)	Blank Wide Flood	Blank Non-Dimming (120V)	Blank 4000K	Blank None
	S Silver	-L15 1500lm (22W)	-B02 2° Pencil Beam	UE-DUN UniDim* (120V/277V)**	-T17 1700K*	-EMAC Emergency Back Up
	BZ Basic Bronze		-B10 Narrow Spot	UE-D10 120V/277V 0-10V Dimming	-T27 2700K	-FR Frosted Lens
	B Black		-B20 Spot	-DIN 2-Wire 10% Dimming (120V)	-T27-C97 2700K 97CRI*	-J8 Integral Junction Box**
	LS Light Silver*		-B45 Flood		-T30 3000K	-LVR Hex-Call Louver*
	DG Dark Grey*		-BWW Wall Wash Optic		-T30-C97 3000K 97CRI*	
	MG Metallic Gold*				-T35 3500K	
	MB Metallic Black*				-T50 5000K	

1(Blank) 1000lm (15W) color temperature is 80CRI minimum, and is not available in 90 plus CRI.
(-L15) 1500lm (22W) is 90CRI minimum with optional 97CRI.

*Special Order. Minimum order, extended lead time may apply. Consult factory. (Finish options 50 piece minimum. 10-12 week lead time)
**DUN Option comes with externally mounted driver. Not for use with Integral Junction Boxes, Flat Junction Boxes or Pendant Systems.



Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA, P.E. LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

COCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ocieassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
CUT SHEETS-PHOTOMETRICS

Sheet # :
E101D

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.
Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

CUT SHEETS - PHOTOMERTICS | 01 | 1/8"=1'-0"

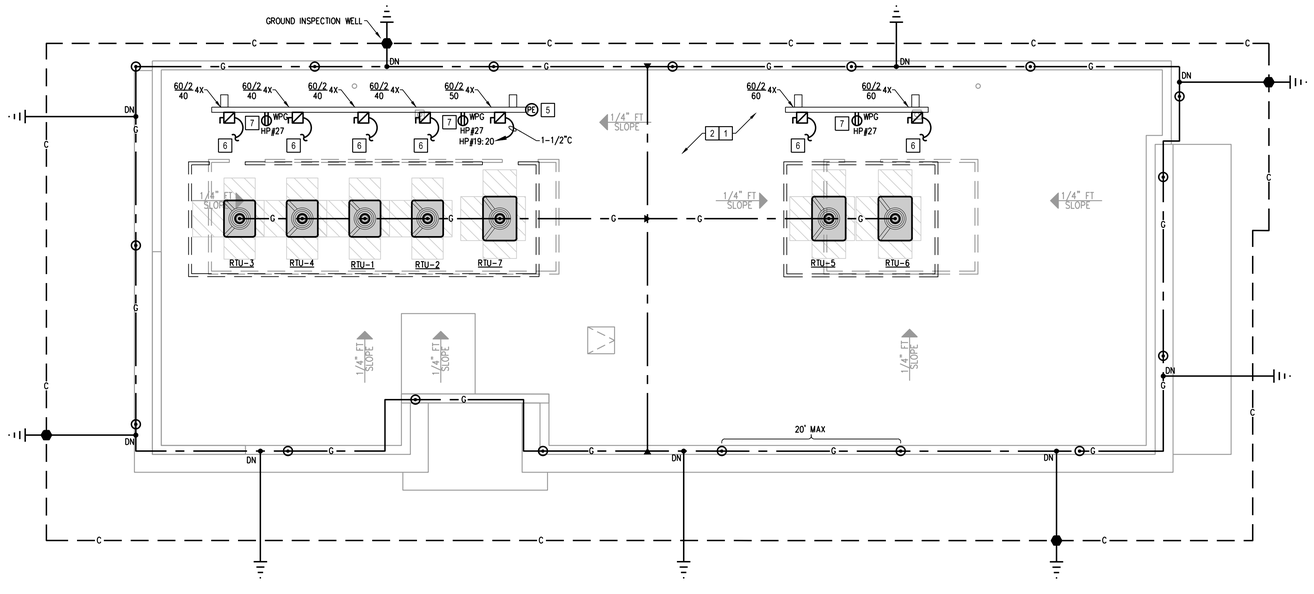
PRINT DATE:1/4/2022 1:30 PM SAVE DATE:12/17/2021 10:13 AM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E101D.DWG

KEYNOTES [X]:

1. BOND ALL EQUIPMENT, DRAINS, MASTS, ETC. ON ROOF.
2. BOND TO MECHANICAL EQUIPMENT LOCATED ON ROOF.
3. PROVIDE UNISTRUT STRUCTURE FOR MOUNTING ELECTRICAL EQUIPMENT SERVING MECHANICAL EQUIPMENT ON ROOF. COORDINATE FINAL LOCATION WITH OTHER TRADES PRIOR TO ROUGH-IN.
4. PROVIDE MECHANICAL CONVENIENCE RECEPTACLE ON UNISTRUT ON ROOF. COORDINATE FINAL LOCATION WITH OTHER TRADES PRIOR TO ROUGH-IN.
5. LOCATE PHOTOCELL ON ROOF FACING NORTH. FIELD COORDINATE FINAL LOCATION.
6. ELECTRICAL CONTRACTOR TO PROVIDE 1-1/2" CONDUIT FROM DISCONNECT SWITCH SERVING RTU UNIT BACK TO RESPECTIVE TENANT SPACE FOR FUTURE TENANT FIT-OUT.
7. PROVIDE LOCKABLE DIE-CAST ALUMINUM WEATHER-PROOF IN-USE COVER - HUBBELL #WP26E OR APPROVED EQUAL. TYPICAL FOR ALL BUILDING EXTERIOR 'WPG' RECEPTACLES. (TYPICAL)

GENERAL NOTES:

1. PROVIDE A COMPLETE LIGHTNING PROTECTION SYSTEM PER CURRENT NFPA 780 AND UL96A STANDARDS.
2. THIS LIGHTNING PROTECTION DRAWING IS FOR DIAGRAMMATIC PURPOSES ONLY. SHOP DRAWINGS ISSUED BY A CERTIFIED LIGHTNING PROTECTION CONTRACTOR SHALL BE USED FOR BIDDING PURPOSES AND SHALL TAKE PRECEDENCE.
3. THE COMPLETED INSTALLATION SHALL MEET THE 'INSTALLATION REQUIREMENTS FOR LIGHTNING PROTECTION SYSTEMS, UL96A' OF UNDERWRITERS LABORATORIES - LATEST EDITION. THE UL MASTER LABEL SHALL BE FURNISHED TO THE OWNER UPON COMPLETION.
4. COPPER LIGHTNING PROTECTION SYSTEM COMPONENTS SHALL NOT BE MOUNTED ON ALUMINUM ROOF OR SIDING OR OTHER ALUMINUM SURFACES AND VICE VERSA.
5. METAL BODIES WITHIN 6'-0" OF THE LIGHTNING PROTECTION SYSTEM SHALL BE BONDED TO THE SYSTEM IN ACCORDANCE WITH UL96A - LATEST EDITION.
6. UNDERGROUND METALLIC PIPING ENTERING THE BUILDING SHALL BE BONDED TO THE NEAREST DOWN CONDUCTOR OR GROUND ELECTRODE.
7. ADHESIVE USED WITH ADHESIVE AIR TERMINAL BASES AND CONDUCTOR FASTENERS SHALL BE COMPATIBLE WITH ROOFING MEMBRANE - VERIFY WITH ROOFING CONTRACTOR.
8. ROOF TOP EQUIPMENT NOT SHOWN ON THIS DRAWING SHALL BE PROTECTED AS REQUIRED TO MEET THE REQUIREMENTS LISTED ABOVE INCLUDING THE INSTALLATION OF AIR TERMINALS AND OR BONDING. IF THE METAL THICKNESS OF AN OBJECT IS 3/16" OR GREATER, AIR TERMINALS MAY BE ELIMINATED IF THE OBJECT IS PROPERLY CONNECTED TO THE SYSTEM.
9. THE DESIGNS SHOWN FOR THESE SYSTEMS ARE SCHEMATIC AND ARE INTENDED TO SHOW BASIC SYSTEM DESIGN. CONTRACTOR SHALL VERIFY DIMENSIONS AND SITE CONDITIONS AND PROVIDE SYSTEMS THAT COMPLY WITH CODE REQUIREMENTS.
10. ALL LIGHTNING CONDUCTORS ARE TO MAINTAIN A HORIZONTAL OR DOWNWARD PATH. ALL BENDS IN THE CONDUCTOR SHALL HAVE A RADIUS BEND OF 8" OR GREATER, AND SHALL HAVE AN ANGLE BEND OF 90 DEGREES OR GREATER.
11. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED NOT MORE THAN 3' MAXIMUM SPACING.
12. COORDINATE ROOF PENETRATIONS WITH ROOFING CONTRACTOR TO MAINTAIN ROOFING SYSTEM INTEGRITY AND WARRANTY.



Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

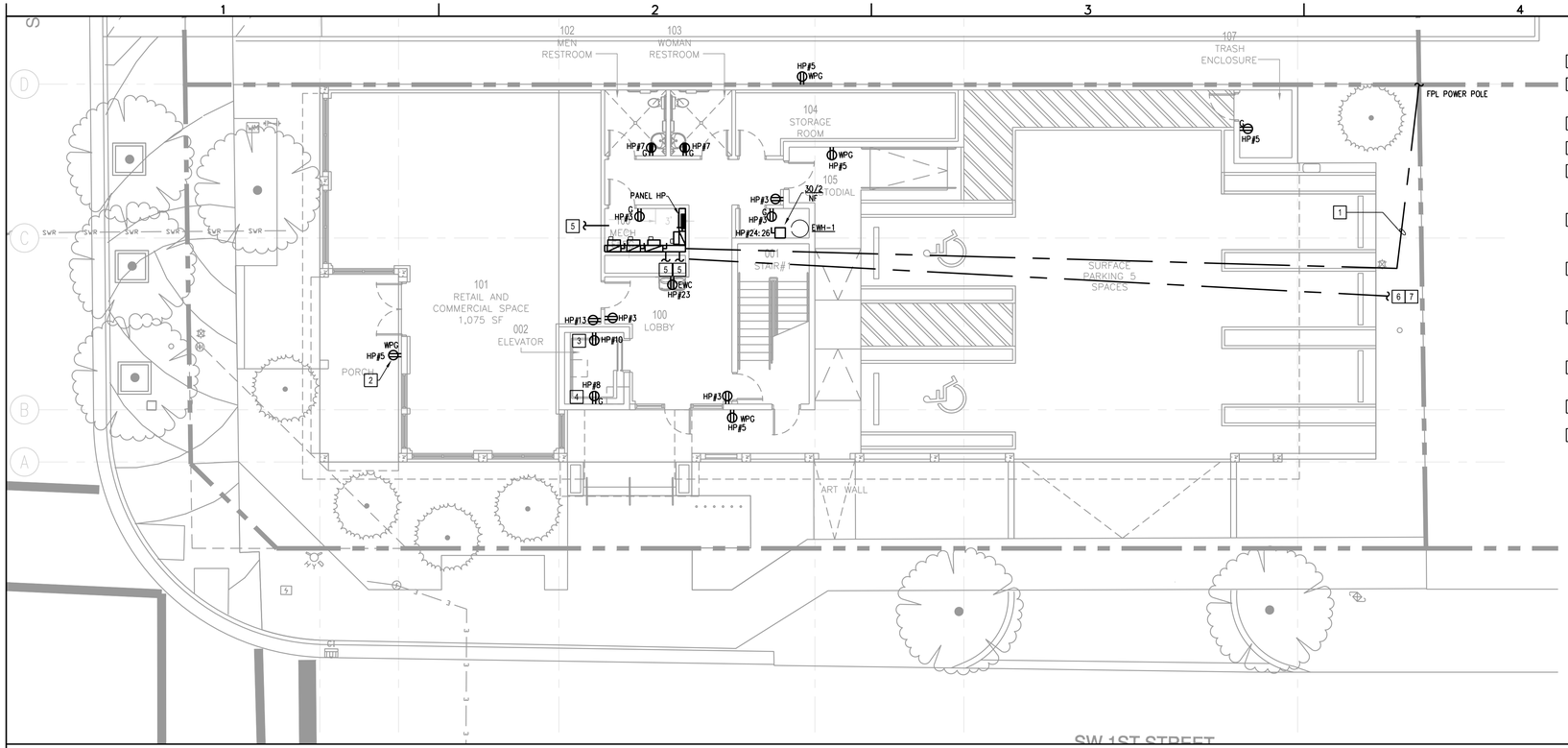
Sheet Title :
ROOF PLAN - ELECTRICAL

Sheet # :
E103

ROOF PLAN - ELECTRICAL | 01 | 1/8"=1'-0"

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.
Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

PRINT DATE:1/4/2022 1:30 PM SAVE DATE:12/17/2021 10:04 AM FILE LOCATION:J:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E103.DWG



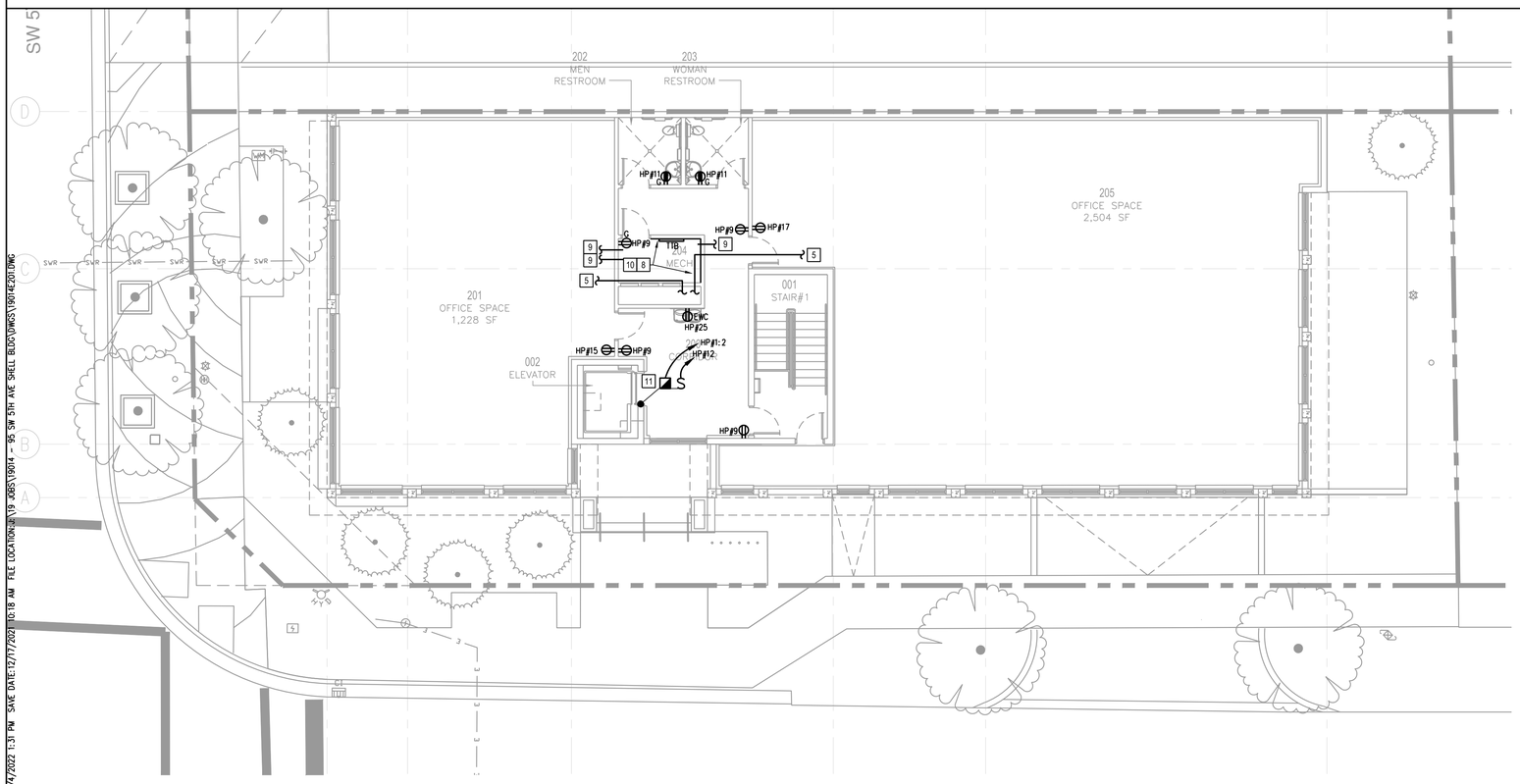
KEYNOTES [X]:

1. REFER TO SHEET E501 FOR CONDUIT AND FEEDER SIZES.
2. PROVIDE LOCKABLE DIE-CAST ALUMINUM WEATHER-PROOF IN-USE COVER - HUBBELL #WP26E OR APPROVED EQUAL. TYPICAL FOR ALL BUILDING EXTERIOR 'WPC' RECEPTACLES. (TYPICAL)
3. POWER CONNECTION FOR SUMP PUMP. REFER TO PLUMBING DRAWINGS FOR ADDITIONAL CONNECTION REQUIREMENT.
4. ELEVATOR PIT RECEPTACLE.
5. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT TO TENANT SPACE FOR FUTURE ELECTRICAL PANEL PROVIDED BY FUTURE TENANT. REFER TO ONE-LINE DIAGRAM ON SHEET E501 FOR QUANTITES AND SIZES.
6. PROVIDE (2) 2" CONDUIT TO ATT PULL BOX LOCATION. COORDINATE FINAL LOCATION WITH SERVICE PROVIDER PRIOR TO ROUGH-IN. CONDUIT TO TERMINATE IN SECOND FLOOR ELECTRICAL ROOM. PROVIDE CONDUIT WITH 200LB PULL STRINGS.
7. PROVIDE (1) 3" CONDUIT TO COMCAST PULL BOX LOCATION. COORDINATE FINAL LOCATION WITH SERVICE PROVIDER PRIOR TO ROUGH-IN.CONDUIT TO TERMINATE IN SECOND FLOOR ELECTRICAL ROOM. PROVIDE CONDUIT WITH 200LB PULL STRINGS.
8. PROVIDE 48"X96"X3/4" MARINE GRADE PLYWOOD BACKBOARDS IN ELEC ROOM 204. MOUNT BACKBOARDS ABOVE WALL OUTLET HEIGHT. BACKBOARDS SHALL RECEIVE TWO (2) COATS OF FIRE RETARDANT WHITE PAINT PAINT.
9. PROVIDE (2) 1"C TO EACH TENANT SPACES FROM ELECTRICAL ROOM 204 TO EACH TENANT SPACE FOR CABLE TV AND TELECOM/DATA REQUIREMENTS.
10. PROVIDE ELECTRICAL GROUND BUS BAR FOR FUTURE DATA REQUIREMENTS.
11. INTEGRAL CIRCUIT BREAKER BY ELEVATOR MANUFACTURER. PROVIDE WITH FULL SIZE GROUND WIRE INTEGRAL CIRCUIT BREAKER IS SHOWN HERE FOR DESIGN PURPOSES ONLY. COORDINATE FINAL CONNECTION REQUIREMENTS WITH ELEVATOR MANUFACTURER PRIOR TO ROUGH-IN.

POWER GENERAL NOTES:

1. COORDINATE EXACT INSTALLATION REQUIREMENTS OF OUTLETS IN MILLWORK WITH ARCHITECTURAL DRAWINGS AND ACCEPTED MILLWORK SHOP DRAWINGS.
2. LOCATIONS OF ALL DEVICES ON DRAWINGS ARE APPROXIMATE ONLY. VERIFY EXACTLY LOCATION WITH OWNERS REPRESENTATIVES, ARCHITECT AND/OR ENGINEER PRIOR TO ROUGH-IN.
3. COORDINATE THE LOCATION OF POWER RECEPTACLES WITH VOICE/DATA OUTLETS ESPECIALLY WHERE COMPUTERS ARE TO BE LOCATED. COORDINATE WITH TECHNOLOGY DRAWINGS.
4. ALL RACEWAYS AND CABLE SHALL BE CONCEALED UNLESS NOTED OR APPROVED IN WRITING BY OWNER AND/OR ENGINEER.
5. MOUNT ALL DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT WITHIN 6FT. OF EQUIPMENT CONNECTION POINT. VERIFY LOCATION OF THE POINT OF CONNECTION WITH EQUIPMENT INSTALLER PRIOR TO ELECTRICAL ROUGH-IN. (DRAWINGS SHOW DIAGRAMMATIC LOCATION OF CONNECTION)
6. ALL CONTROL WIRING FOR MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR.

1ST LEVEL FLOOR PLAN - POWER & SYSTEMS | 01 | 1/8"=1'-0"



2ND LEVEL FLOOR PLAN - POWER & SYSTEMS | 02 | 1/8"=1'-0"

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

PRINT DATE:1/4/2022 1:31 PM SAVE DATE:12/17/2021 10:18 AM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E201.DWG

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

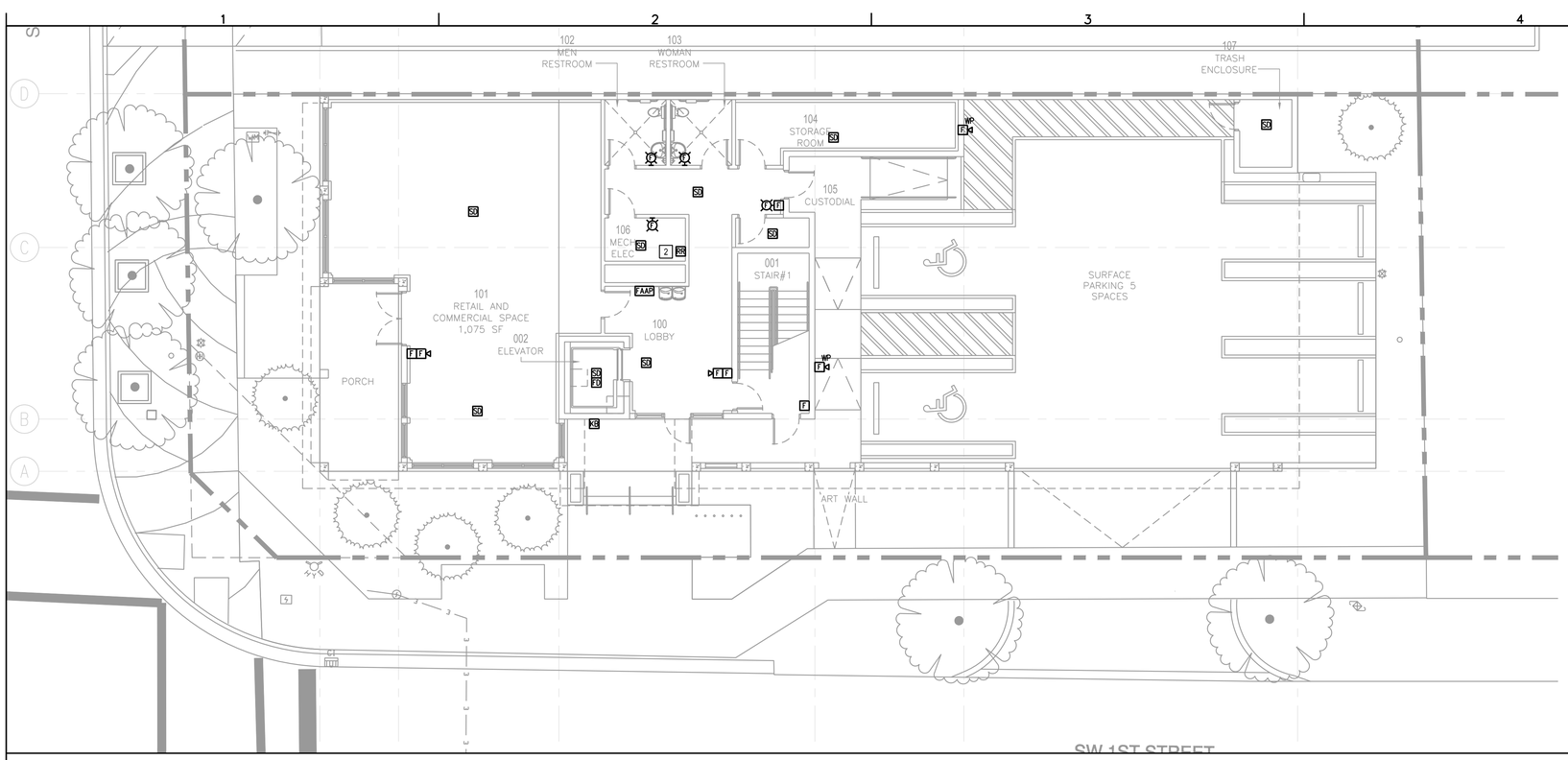
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :

FLOOR PLANS - POWER & SYSTEMS

Sheet # :

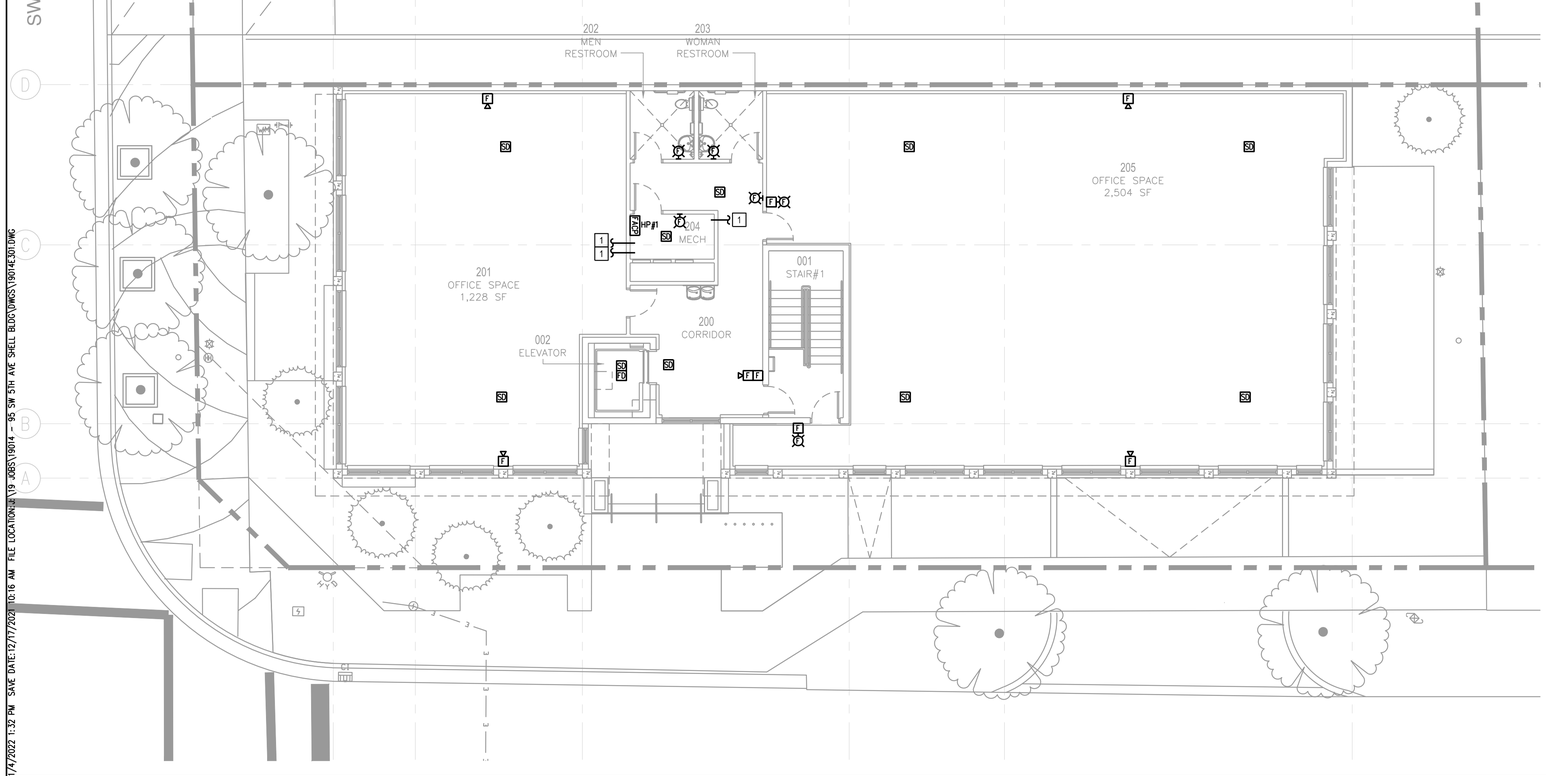
E201



KEYNOTES [X]:

1. PROVIDE 1" CONDUIT FROM FIRE ALARM CONTROL PANEL TO EACH TENANT SPACE FOR FUTURE USE.
2. SHUNT TRIP RELAY FOR ELEVATOR.

1ST LEVEL FLOOR PLAN - FIRE ALARM | 01 | 1/8"=1'-0"



2ND LEVEL FLOOR PLAN - FIRE ALARM | 02 | 1/8"=1'-0"

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

PRINT DATE:1/4/2022 1:52 PM SAVE DATE:12/17/2021 10:16 AM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E301.DWG

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

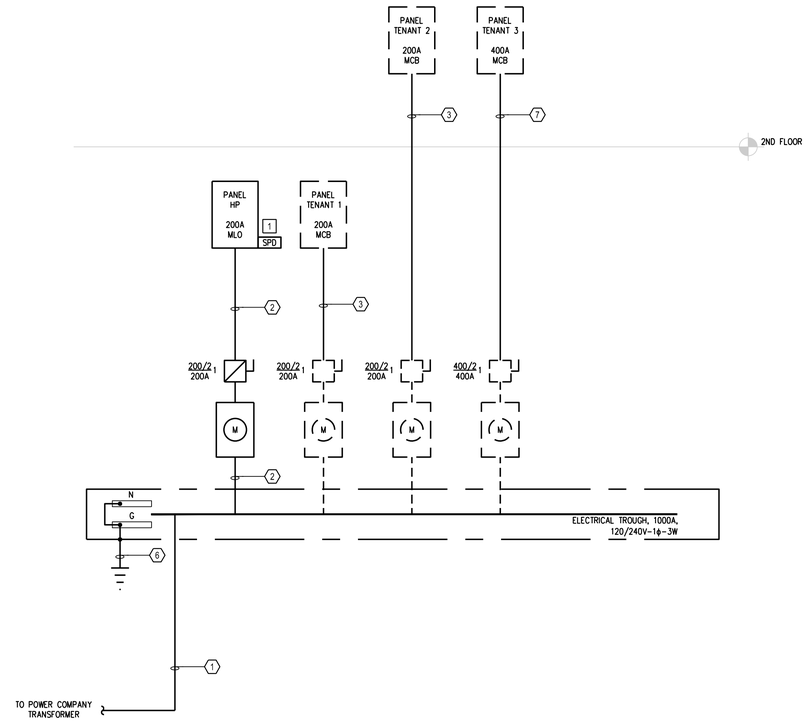
Sheet Title :

FLOOR PLANS - FIRE ALARM

Sheet # :

E301

SERVICE CALCULATION															
TENANT 1 - 1st floor								**TENANT 2 - 2nd floor**							
AREA =	1075	SQ.FT.						AREA =	1288	SQ.FT.					
LIGHTING		2 VA/SQ.FT.	=	2150	VA			LIGHTING		2 VA/SQ.FT.	=	2576	VA		
CONVENIENCE		3VA/SQ.FT.	=	3225	VA			CONVENIENCE		3 VA/SQ.FT.	=	3864	VA		
HVAC		15 VA/SQ.FT.	=	16125	VA			HVAC		15 VA/SQ.FT.	=	19320	VA		
EQUIPMENT		2 VA/SQ.FT.	=	2150	VA			EQUIPMENT		2 VA/SQ.FT.	=	2576	VA		
	23650	VA @ 120/240V - 1PH - 3W	=	99	AMPS				28336	VA @ 120/240V - 1PH - 3W			=	118	AMPS
SERVICE =	200A	AMPS @ 120/240-1PH-3W						SERVICE =	200	AMPS @ 120/240V - 1PH - 3W					
HOUSE PANEL								**TENANT 3 - 2nd floor**							
AREA =	4250	SQ.FT.						AREA =	2504	SQ.FT.					
LIGHTING		2 VA/SQ.FT.	=	8500	VA			LIGHTING		2 VA/SQ.FT.	=	5008	VA		
CONVENIENCE		1 VA/SQ.FT.	=	4250	VA			CONVENIENCE		3 VA/SQ.FT.	=	7512	VA		
ELEVATOR		15HP	=	14400	VA			HVAC		15 VA/SQ.FT.	=	37560	VA		
HVAC			=	20000	VA			EQUIPMENT		2 VA/SQ.FT.	=	5008	VA		
SITE LIGHTING			=	1000	VA										
	48150	VA @ 120/240V - 1PH - 3W	=	201	AMPS				55088	VA @ 120/240V - 1PH - 3W			=	230	AMPS
SERVICE =	400	AMPS @ 120/240V - 1PH - 3W						SERVICE =	400	AMPS @ 120/240V - 1PH - 3W					
								TENANT SERVICE SUMMARY							
												VOLT-AMPERES			
								TENANT 1				23650			
								TENANT 2				28336			
								TENANT 4				55088			
								HOUSE PANEL				48150			
											TOTAL	155224		= 647	AMPS
									155224	VA @ 120/240V - 1PH - 3W					
								SERVICE =	1000	AMPS @ 120/240V - 1PH - 3W					



GENERAL NOTES:

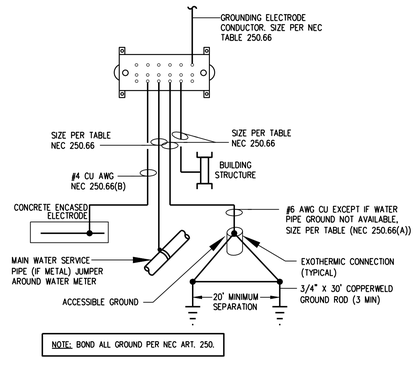
1. BASIS OF DESIGN FOR POWER DISTRIBUTION EQUIPMENT IS SQUARE-D. IF CONTRACTOR SUBMITS APPROVED ALTERNATES, CONTRACTOR SHALL VERIFY EQUIPMENT DIMENSIONS MEET NEC WORKING SPACE AND DEDICATED SPACES CLEARANCES PER NEC.
2. PROVIDE FIELD MARKING OF THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SERVICE EQUIPMENT PER NEC 110.24. FIELD MARKING SHALL BE LEGIBLE AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
3. POLE MOUNTED SERVICE TRANSFORMER PROVIDED BY FP&L. COORDINATE ELECTRICAL SERVICE WITH FP&L PRIOR TO START OF ANY WORK.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL METER EQUIPMENT REQUIREMENTS WITH FP&L PRIOR TO START OF ANY WORK.

FEEDER SCHEDULE (X):

(1) (3) SETS OF (3) #400 KCMIL, EA. IN 4"C.
(2) (3)#3/0 AWG, #6 GND, IN 2-1/2"C.
(3) 2-1/2"C
(4) 2"C
(5) 1-1/4"C
(6) (1) #2/0 GND, IN 1"C.
(7) 3-1/2"C

KEYNOTES [X]:

[1] SURGE PROTECTIVE DEVICE



2 E501 SERVICE GROUNDING DETAIL

NOT TO SCALE

1 E501 ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE

PANEL HP
LOCATION ELEC RM. 106 –
SERVICE 120/240V-1ϕ-3W
RATING 200A MLO
MINIMUM BREAKER AIC 22,000
MOUNTING SURFACE

LOAD DESCRIPTION	BKR TRIP	BKR POLES	KVA øA	KVA øB	CKT. NO.		KVA øA	KVA øB	BKR TRIP	BKR POLES	LOAD DESCRIPTION
E-FACP (L)(R)	20	1	0.00		1	2	7.20		90	2	M-ELEVATOR (S)
R-LOBBY 100 REC.	20	1		0.90	3	4		7.20			M-
R-EXT RECEPTACLES	20	1	0.90		5	6	0.20		20	1	L-SHAFT LTG
R-GND FLR RR RECEPT.	20	1		0.36	7	8		0.18	20	1	R-PIT RECEPT.
R-CORRIDOR 200 REC.	20	1	0.72		9	10	1.44		20	1	M-SUMP PUMP/OIL MINDER
R-2ND FLR RR RECEPT.	20	1		0.36	11	12		0.50	20	1	L-CAB LTG (G)
L-RETAIL 101 LTG	20	1	0.50		13	14	0.70		20	1	L-GND FLR COMMON AREA
L-OFFICE SPACE 201 LTG	20	1		0.50	15	16		0.45	20	1	L-2ND FLR COMMON AREA
L-OFFICE SPACE 205 LTG	20	1	0.90		17	18	0.22		20	1	L-STAIRWELL LTG
M-RTU 7	50	2		3.10	19	20		0.10	20	1	L-WALL PACK LTG
M-			3.10		21	22	0.38		20	1	L-PARKING LIGHTING
E-EWC 1ST FLOOR	20	1		0.58	23	24		0.75	20	2	E-EWH-1
E-EWC 2ND FLOOR	20	1	0.58		25	26	0.75				E-
R-ROOF RECEPT.	20	1		0.54	27	28		0.20	20	1	E-LIGHTING CONTACTOR PANEL
SPARE	20	1	0.00		29	30	0.00		20	1	SPARE
SPARE	20	1		0.00	31	32		0.00	20	1	SPARE
SPARE	20	1	0.00		33	34	0.00		20	1	SPARE
SPARE	20	1		0.00	35	36		0.00	20	1	SPARE
SPARE	20	1	0.00		37	38	0.00		20	1	SPARE
SPARE	20	1		0.00	39	40		0.00	30	2	O-SPD
SPARE	20	1	0.00		41	42	0.00				O-
TOTALS			6.70	6.34	><		10.89	9.38			

LOAD CALCULATIONS:	CONN. LOAD – KVA	D.F.	CALC. DEMAND – KVA	LOADS NOT INCLUDED IN CALCULATIONS:
LIGHTING	4.45	1.25	5.56	0.00
RECEPTACLES – 1ST 10 KVA	3.96	1.00	3.96	NOTES:
RECEPTACLES – ABOVE 10 KVA	0.00	0.50	0.00	(G) PROVIDE GFCI BREAKER
HVAC	0.00	1.00	0.00	(L) PROVIDE LOCK-ON DEVICE
MOTORS	22.04	1.00	22.04	(S) PROVIDE SHUNT TRIP BREAKER
EQUIPMENT	2.86	1.00	2.86	(R) RED BREAKER
APPLIANCE	0.00	0.75	0.00	
SPARE/SPACE	0.00	1.00	0.00	
OTHER	0.00	1.00	0.00	
TOTAL KVA (AMPS)	33.31 (138.79)		34.42 (143.43)	

Song + Associates
Architecture ● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

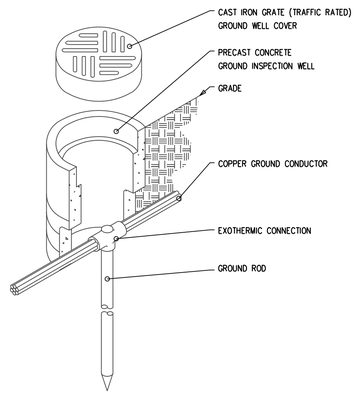
Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW
Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
ONE-LINE DIAGRAM & PANEL SCHEDULES - ELECTRICAL

Sheet # :
E501

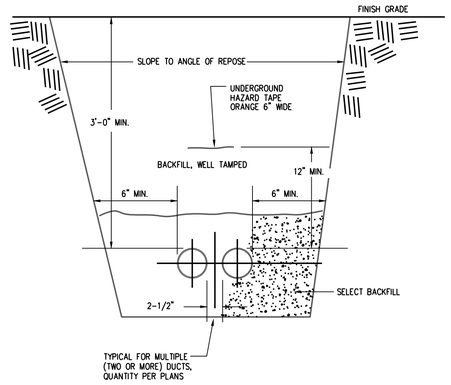
This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.
Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

PRINT DATE:1/4/2022 1:32 PM SAVE DATE:12/17/2021 10:09 AM FILE LOCATION:J:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E501.DWG



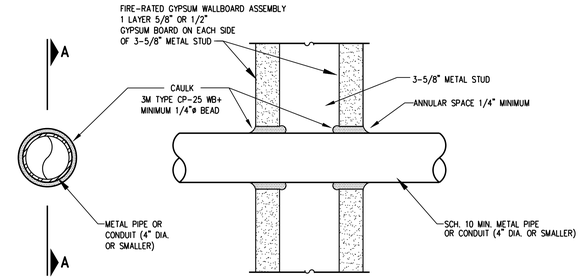
7 / E601 GROUND INSPECTION WELL

N.T.S.



4 / E601 TYPICAL DUCT DETAIL

N.T.S.



FRONT VIEW

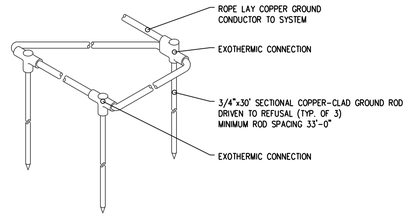
SECTION A-A

ALL SURFACES SHOULD BE CLEAN, SOUND AND DRY PRIOR TO APPLICATION OF FIRESTOPPING MATERIALS. IF THE OPENING IS NOT SLEEVED, INSTALL A GALVANIZED STEEL SLEEVE AROUND THE PIPE AND ANCHOR IT IN PLACE.

U.L. SYSTEM NO. WL1001

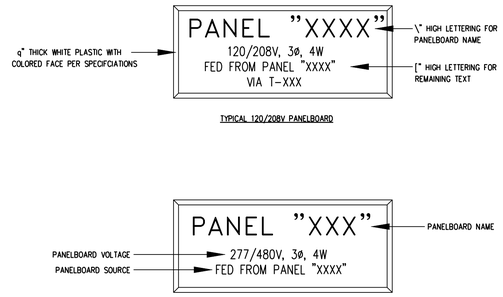
1 / E601 ONE HOUR FIREWALL PENETRATION DETAIL

N.T.S.



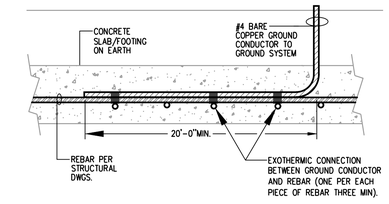
8 / E601 TYPICAL GROUND ARRAY DETAIL

N.T.S.



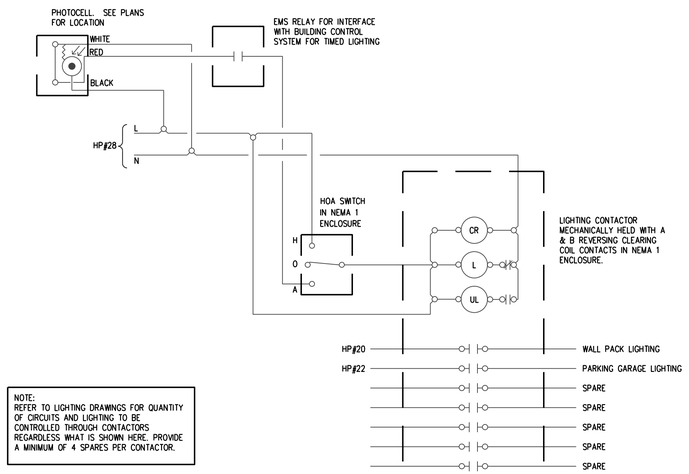
5 / E601 PANELBOARD NAMEPLATE

N.T.S.



2 / E601 TYPICAL CONCRETE ENCASED ELECTRODE

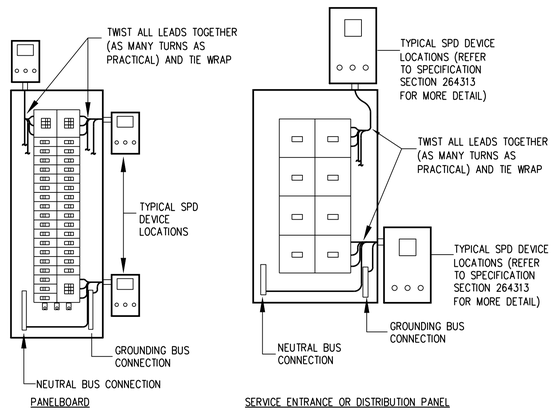
N.T.S.



NOTE:
REFER TO LIGHTING DRAWINGS FOR QUANTITY OF CIRCUITS AND LIGHTING TO BE CONTROLLED THROUGH CONTACTORS REGARDLESS WHAT IS SHOWN HERE. PROVIDE A MINIMUM OF 4 SPARES PER CONTACTOR.

9 / E601 EXTERIOR LIGHTING CONTACTOR WITH PHOTOCELL DETAIL

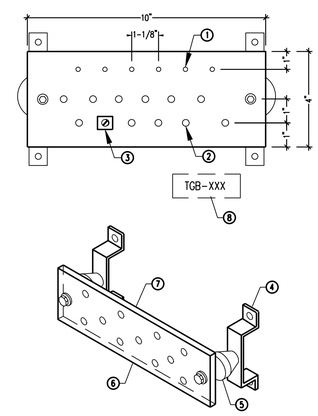
N.T.S.



NOTE: MOUNT SPD DEVICE IN A LOCATION TO MAINTAIN LEADS AS SHORT AS POSSIBLE. (24" MAX.)

6 / E601 SPD INSTALLATION DETAIL

N.T.S.



GENERAL

1. ALL HARDWARE (BOLTS, NUTS WASHERS, ETC.) SHALL SHALL BE SOLID COPPER OR BRONZE. COPPER PLATING SHALL NOT BE ACCEPTABLE.
2. BUSBAR SHALL BE 1/4" THICK(MINIMUM).
3. INCREASE LENGTH OF BUSBAR, FOR NUMBER OF OF CONNECTIONS, AS REQUIRED TO MAINTAIN CORRECT SPACING BETWEEN LUGS.

NOTE

1. #6/32 (TYPICAL)
2. #9/32 (TYPICAL)
3. PROVIDE COPPER CABLE CLAMPS FOR CABLE CONNECTIONS (BY ELECTRICAL CONTRACTOR).
4. STANDOFF BRACKET
5. INSULATOR
6. CADWELD544A018 OR EQUAL
7. COPPER BUSBAR
8. PROVIDE WHITE CORE BAKELITE NAMEPLATE FASTENED TO A WALL/SURFACE BELOW BUSBAR AT EACH FLOOR, WITH DESIGNATION ENGRAVED THEREON IN 1/2" HIGH LETTERS.

3 / E601 TYPICAL GROUND BUS BAR

N.T.S.

PRINT DATE:1/4/2022 1:32 PM SAVE DATE:12/16/2021 4:22 PM FILE LOCATION:C:\19 JOBS\19014 - 95 SW 5TH AVE SHELL BLDG\DWGS\19014E601.DWG

DETAILS - ELECTRICAL | 01 | N.T.S.

This item has been electronically signed and sealed by Sudharma Wijegunawardana, PE on 01/05/2022 using a SHA-1 authentication code.

Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

Song + Associates

Architecture ● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

SUDHARMA WIJEGUNAWARDANA, LICENSE NO. 63143 STATE OF FLORIDA PROFESSIONAL ENGINEER

SUDHARMA WIJEGUNAWARDANA, P.E.
2 HARVARD CIRCLE, SUITE 100
WEST PALM BEACH, FL 33409
FL. REG. NO.: PE63143

OCI CONSULTING ENGINEERS
Orlando • Ft. Pierce • West Palm Beach • Miami • Ft. Myers • Tampa
Washington DC • Baltimore • Norfolk • Dallas • San Francisco
2 Harvard Circle, Suite 100 West Palm Beach, FL 33409
Phone: (561) 688-6575 Fax: (561) 688-6576
www.ociassociates.com
Certificate of Authorization #6261

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan :

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By : CJC
Checked By : SW

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
DETAILS - ELECTRICAL

Sheet # :
E601

EXHIBIT B

Ahrens Enterprises, Inc. DBA Ahrens Companies Bid

Ahrens Enterprises, Inc. DBA Ahrens Companies Schedule of Values

ORIGINAL COPY

WWW.AHRENSCOMPANIES.COM
CONTACT: RICHARD C. AHRENS
1461 KINETIC ROAD, LAKE PARK, FL 33403 | 561-839-9004 | INFO@AHRENSCOMPANIES.COM

SINCE 1902
AHRENS
DESIGN/BUILD • GENERAL CONSTRUCTION

BID FOR:

DELRAY BEACH COMMUNITY REDEVLOPMENT AGENCY (CRA)

CRA NO. 2022-01

95 SW 5TH AVENUE

COMMERCIAL BUILDING CONSTRUCTION BID

DUE: NOVEMBER 16, 2022 AT 3:00PM (revised)

COMMUNITY REDEVELOPMENT AGENCY
DELRAY BEACH CRA

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY
CONTACT: IVAN CABRERA
20 N. SWINTON AVENUE,
DELRAY BEACH, FLORIDA 33444

TABLE OF CONTENTS

- Bid Submittal Page.....
- Solicitation Summary Form.....
- Acknowledgment of Addenda.....
- Bid Submittal Signature Page.....
- Bid Pricing Form (Schedule of Values).....
- Conflict of Interest Disclosure Form.....
- Scrutinized Companies Certification Pursuant to Florida Statutes § 287.135...
- Notification of Public Entity Crimes Law.....
- Notification of Public Records Law.....
- Drug-Free Workplace.....
- Non-Collusion Affidavit.....
- Sample Bid Bond (Example of Required Bid Bond to be submitted).....

TABLE OF CONTENTS

❖ Minimum Qualifications.....

- General Contractors Licenses.....
- Department of State Supporting Documents.....
- State of Florida Business Registration.....
- Five (5) Project References - Exhibit E.....
- Short Narrative / Team Info.....
- Subcontractor Info .....

SECTION 5: BID FORMS AND AFFIDAVITS

BID FORMS AND AFFIDAVITS

The forms listed below shall be completed by an authorized agent of the Bidder having legal authorization to contractually bind the Bidder's company or firm. Each signature/acknowledgement represents a binding commitment upon the Bidder to provide the goods and/or services offered to the CRA if the Bidder is awarded the Contract.

1. Bid Submittal Page
2. Solicitation Summary Form
3. Acknowledgement of Addenda
4. Bid Submittal Signature Page
5. Bid Pricing Form (Schedule of Values)
6. Conflict of Interest Disclosure Form
7. Scrutinized Companies Certification Pursuant to Florida Statutes § 287.135
8. Notification of Public Entity Crimes Law
9. Notification of Public Records Law
10. Drug-Free Workplace
11. Non-Collusion Affidavit
12. Sample Bid Bond (Example of Required Bid Bond to be submitted)

ORIGINAL COPY

BID SUBMITTAL PAGE

This Bid Submittal Page and all following pages shall be included in the original Bid package.

Please also include any additional information or documentation as required by this ITB.

INSTRUCTIONS

Sealed Bids must be received by the CRA on or before the Bid Submission Due Date and Time via hard copy at the CRA Office , located at 20 N. Swinton Avenue, Delray Beach, Florida 33444. Normal business hours are 8:00 AM EST to 5:00 PM EST, Monday through Friday, except holidays. All Bids will be publicly opened at the CRA Office immediately after the Bid Submission Due Date and Time unless otherwise specified.

Each Bid submitted to the CRA shall have the following information clearly marked on the face of the package: Bidder's name, return address, ITB number, Bid Submission Due Date, and the title of the Bid. Included in the package shall be one (1) hard copy clearly identified as the "Original" that include signed originals of all required forms, and one (1) electronic version of the Bid on a Universal Serial Bus (USB) drive in legible and searchable PDF format. If any of the required forms are not included in the Bid and/or are not signed or if any of the required information is not included in the Bid, the CRA may deem the Bid non-responsive. Bids deemed non-responsive are not evaluated or considered by the CRA.

ITB CRA No.: **2022-01**

Title: **95 SW 5th Avenue Commercial Building Construction**

Due Date and Time: **October 21, 2022 @ 2:00 PM EST**
*Amended to November 16, 2022 @3:00PM EST per Addendum 4

Ahrens Enterprises, Inc. dba AHRENS Companies

Name of Bidder

ORIGINAL COPY

SOLICITATION SUMMARY FORM

IMPORTANT NOTICE

The information you provide on this page will be read aloud at the PUBLIC OPENING for this Bid Solicitation. It is VERY IMPORTANT that the summary information you provide below is exactly the same information contained in your Bid. If subsequent to the opening of Bids, the CRA determines that the information contained in your Bid is different from the information on this Solicitation Summary Form, the CRA reserves the right to deem your Bid NON-RESPONSIVE, and remove your Bid from further evaluation and consideration for contract award.

BID INFORMATION

Bid Number:	ITB CRA No. 2022-01
Title:	95 SW 5th Avenue Commercial Building Construction
Due Date and Time:	October 21, 2022 @ 2:00PM EST
Name of Bidder:	Ahrens Enterprises, Inc. dba AHRENS Companies
Address:	1461 Kinetic Road, Lake Park, FL 33403
Bid Amount:	$ 2,739,968.00
Written Bid Amount:	Two Million Seven Hundred Thirty-Nine Thousand Nine Hundred Sixty-Eight Dollars and Zero Cents
Authorized Agent:	Richard C. Ahrens
Authorized Agent Signature:	Richard C. Ahrens
Date:	November 16, 2022

By signing and submitting this Solicitation Summary Form, the Bidder affirms that the information provided above is an exact and correct summary of the information contained in the Bidder's Bid to the Delray Beach Community Redevelopment Agency.

THIS SOLICITATION SUMMARY MUST BE SIGNED AND INCLUDED AS AN ORIGINAL HARDCOPY IN THE SEALED PACKAGE CONTAINING YOUR BID.

ORIGINAL COPY

The Delray Beach Community Redevelopment Agency
ITB CRA No. 2022-01
95 SW 5th Avenue Commercial Building Construction

ACKNOWLEDGEMENT OF ADDENDA

INSTRUCTIONS: COMPLETE PART I OR PART II, WHICHEVER APPLIES, AND SIGN

PART I:

List below the dates of issue for each addendum received in connection with this Solicitation:

Addendum #1, Dated October 10, 2022

Addendum #2, Dated October 13, 2022

Addendum #3, Dated November 02, 2022

Addendum #4, Dated November 07, 2022

Addendum #5, Dated _____

Addendum #6, Dated _____

Addendum #7, Dated _____

Addendum #8, Dated _____

PART II:

☐ NO ADDENDUM WAS RECEIVED IN CONNECTION WITH THIS SOLICITATION

Ahrens Enterprises, Inc. dba AHRENS Companies

Name of Bidder

Richard C. Ahrens

Authorized Agent Signature

Richard C. Ahrens President/CEO

Name and Title of Authorized Agent (Print or Type)

November 16, 2022

Date

ORIGINAL COPY

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 1
TO
INVITATION TO BID NO. CRA 2022-01
95 SW 5TH AVENUE COMMERCIAL BUILDING CONSTRUCTION

OCTOBER 10, 2022

TO ALL PROPOSERS AND OTHERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Questions contained in this Addendum include ones asked at the September 15, 2022, Voluntary Pre-Bid Meeting. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

MODIFICATION:

Wherever applicable throughout the ITB document, Bidders are hereby advised that the Bid Submission Due Date and Time has been extended to **Wednesday, November 9, 2022, at 3:00PM EST**. The location of delivery for the Bids has not changed.

QUESTIONS:

1. **What is the estimated construction budget?**

   The budget for this Project is to be determined. The Project is a part of the Delray Beach CRA's Fiscal Year 2022-2023 Work Plan and is fully funded. The ITB document includes all Technical Specifications and Construction Documents for the specific purpose of obtaining Bids from all interested qualified Bidders.

---

2. **What is the work schedule for the Project?**

   Section 3, Scope of Work and Technical Specifications, of the ITB provides the working hours for the Project:

   Working hours for this Project shall be:
   - i. 8:00 a.m. EST to 5:00 p.m. EST Monday through Friday, except holidays
   - ii. 8:00 a.m. EST to 5:00 p.m. EST Saturday, if required and previously requested by the Contractor and approved by the CRA.

   Work shall not be performed on City Holidays and Sundays.

---

3. **Can the Owner provide the specification for the elevator? Specifically, elevator type, manufacturer, and cab finishes.**

   Please see below specification for the elevator:

   Basis of Design: Thyssenkrupp
   Endura HMRL (Hydraulic Machine Room Less)
   One Speed - Right Hand
   3,000 lbs. Capacity – 150 fpm

   Cab finishes will be selected by the Owner and provided to the Contractor.

---

4. **The plans show a new dumpster. Can the Owner provide the drawings for the dumpster detail and dumpster gate?**

   There is no dumpster for this Project. There is an enclosed room with a louvered door which will store two rolling trash bins (96 gallons) that will be manually rolled to the curbside for pick-up.

   Refer to sheets A-201, A-600, and A-800 for room and louvered door details.

   Trash bins will be purchased by the CRA. Bidders shall not include the cost of trash bins in their submitted Bid Price.

---

5. **Can the Owner provide the Geotechnical Report for the Project?**

   A Geotechnical Report is being finalized; it will be provided to the Awarded Bidder.

---

6. **Specifications call for the removal of buried underground tanks. Can the Owner please provide clarify if there are any buried underground tanks?**

   There are no buried underground tanks that need to be removed.

   Please disregard Specification Section 026500.

---

7. **Can the Owner please provide a detail for the concrete pavement area designed for the parking area. These are not shown either on civil or structural plans.**

   A minimum concrete slab thickness of 6" with #4 bars 12" o.c. both ways with a minimum compressive strength of 4,000psi at 28days.

   Based upon the design, the minimum concrete pavement elevation is 14.50", and assuming a 6" slab allows for a minimum of 12" of subgrade between the top of the Stormcapture® vaults and the bottom of the concrete pavement.

   Please refer to note number 18.18.2 subgrade materials specifications.

   The details and specifications related to the Stormcapture system are attached to this Addendum.

---

8. **Does the CRA have a place or empty lot in the vicinity of the Project that the Contractor can use for staging and as a laydown area during the construction process?**

   The CRA owns one (1) vacant lot located at 105 SW 5th Avenue, Delray Beach, FL 33444. The vacant lot is located near the Project site and may be utilized by the Contractor for staging and parking purposes during the construction phase of the Project. The terms for the temporary use of the vacant lot will be negotiated with the Awarded Bidder prior to the finalization of the Contract.

   If more space is needed, the Contractor will be responsible for finding additional space for staging and parking and contracting with private owners. Nearby public parking lots shall not be used for staging purposes or parking of heavy construction equipment.

---

9. **What is the correct finish for the aluminum storefronts and doors? The plans do not show the finish and the specifications provide both clear anodized satin silver and a kynar finish.**

   The finish for the storefronts and doors shall be a clear anodized satin silver finish.

---

10. **What is the correct glass required for this Project? The plans show 9/16" Atlantica green tint with Low E (SC=0.64 & U=1.0 or better). The specifications state insulated laminated glass with gray tint and low E. (U=0.57, VLT=30%, SHGC=0.25).**

    Insulated laminated glass with gray tint and low E. (U=0.57, VLT=30%, SHGC=0.25) shall be used for this Project.

---

11. **The plans list Trulite 351 door NOA number and Trulite 3100 system NOA numbers on sheet A-800. Yet the specifications do not call out Trulite as an option. The specifications list three other companies. Can we bid the Trulite systems?**

    Please use the Trulite information provided in the plans. The Truelite products provided in the plans were the Basis of Design for the Project.

---

12. **Cast in place concrete beam schedule shows FB3 called 16" wide (drawing no. S20), but on section details it measures 8" wide (drawing no. S21). Please confirm which size is correct.**

    Please use width of beam of 16".

---

13. **Sheet A-621 is missing from the ITB documents. Please provide missing sheet.**

    Sheet A-621 is attached to this Addendum.

---

14. **Are Bidders required to use the Bid Bond Form included in the ITB document on page 47-48. If so, the Bid Bond form is titled SAMPLE BID BOND. Is this correct? Please clarify.**

    The BID BOND has been revised and is attached to this Addendum. Bidders are required to use the revised BID BOND when submitting a Bid.

---

15. **There is no support beam at the 2nd floor stair landing (sheet S.20), but a support beam shows on (sheet A-620). Please clarify.**

    Sheet A-620 shows part of metal pan stair. The metal pan stair and landing are pre-engineered. Please refer to specification section #05 51 00 for details on the metal pan stairs (page 108 of the Specification file).

---

16. **Please confirm the roof minimum R-Value for the Lightweight Insulating Concrete.**

    The minimum R-Value required for the lightweight roof insulating concrete is R-20.

---

17. **FB1A shows on concrete beam schedule, but it does not show on the floor plan (Drawing S20), please clarify.**

    FB1A not used in the project. Drawing S20 is attached to this Addendum.

---

18. **F36 shows on the spread footing schedule, but it is not show on the floor plan (Drawing S10), please clarify.**

    F36 not used in the project. Drawing S10 is attached to this Addendum.

---

19. **C1 square appearance on the floor plan does not match with the square appearance of the column schedule (Drawing S10) , please clarify.**

    C1 is a square column sometimes with poured wall attached. Drawing S10 is attached to this Addendum.

---

20. **Two columns do not have marks (Drawing S10). Please clarify.**

    C1 at grid line 1D, wall at grid line 2B. Drawing S10 is attached to this Addendum.

---

21. **2nd floor and roof framing plans, (Drawings S20 and S30) show a note of the slab with #3 at 12" OC, but on detail 7 (Drawing S22), it shows reinforcement with #4. Please clarify.**

    Detail 7 (Drawing S22) revised. Drawing S22 is attached to this Addendum.

---

22. **Drawing S30 shows point arrow 9 (Drawing S31) does not match what shows in the detail, RB3. Please clarify.**

    Detail 9 (Drawing S31) revised. Drawing S31 is attached to this Addendum.

---

23. **Drawing S20 does not show what kind of beam goes by schedule or will it be considered a couble bond beam. Please clarify.**

    Use double bond beam unless FB shows on wall. Drawing S20 is attached to this Addendum.

ADDENDUM NO.1 ATTACHMENTS:

1. Bid Bond
2. Stormcapture Design Summary
3. Sheet A-621
4. Drawing S10-R1
5. Drawing S20-R1
6. Drawing S22-R1
7. Drawing S31-R1

ORIGINAL COPY

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 2
TO
INVITATION TO BID NO. CRA 2022-01
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

OCTOBER 13, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to clarify the BID BOND document. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

CLARIFICATION

The BID BOND has been revised and attached to this Addendum #2. Bidders are required to use this revised BID BOND when submitting a Bid.

Please disregard other BID BOND documents previously issued.

ADDENDUM NO.2 ATTAC MENTS

1. Bid Bond

ORIGINAL COPY

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 3
TO
INVITATION TO BID NO. CRA 2022-01-R
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

NOVEMBER 2, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

NOTE

Wherever applicable throughout the ITB document, Bidders are hereby advised that the ITB NO.CRA 2022-01 is now **ITB NO. CRA 2022-01-R**. Bid Submission Due Date and Time remains **W**ednesday **, N**ovember **9, 2022,** at **3 00PM EST**. The location of delivery for the Bids remains the CRA Office located at 20 N Swinton Avenue, Delray Beach, FL 33444.

ADDITIONAL INFORMATION

The Geotechnical Report for the Project Site is attached to this Addendum No. 3.

QUESTIONS

1. **On sheet E101B, the two fixtures are marked "relocated" –** should these be included in the **B**id **P**rice

   These two fixtures are under the new building footprint. As such, their relocation should be included in the scope of work for the Project and Bid Price.

2. **On sheet E101A both "D" fixtures are marked as "D" [illegible] E101 [illegible] is "DE", please clarif[illegible].**

   The fixture marked "DE", as indicated in sheet E101 at the exit door, is correct. Please use this reference for sheet E101A as well.

---

3. **O[illegible] E101 [illegible] [illegible] XC1 [illegible], [illegible] is the "X" fixture on the schedule or different [illegible]**

   X and X1 shall be the same fixture. Any reference to XC1 shall be replaced by X and/or X1. There is no XC1 fixture included on the schedule.

---

4. **On sheet E101 there is a "PGE" by the storage room [illegible] E101A P[illegible], [illegible].**

   On sheet E101, the fixture is "PGE" by the storage room.
   On sheet E101A Photometrics, the same fixture is "PG" by the storage room.

---

5. **P[illegible] S[illegible] 2 S[illegible] T[illegible] [illegible] C[illegible], [illegible] N[illegible]. 15 BID BOND/GUARRANTY…." Additionally, B[illegible] [illegible] B[illegible] [illegible]"...I[illegible] [illegible]**

   Yes, such a letter will suffice this requirement.

---

6. **P[illegible] [illegible] [illegible] [illegible], [illegible], [illegible]. I[illegible]**

   Refer to duct construction schedule on sheet M-601 and specification sections No. 230700 and 23100 for the appropriate materials.

---

7. **R[illegible] M[illegible] B[illegible] M[illegible]. C[illegible] TOP**

   Please provide specified material only. A single-ply TPO membrane system is not acceptable for this Project.

8. **Page 33 of the ITB states, "Bidders must provide all applicable Certificate of Competency(ies) issued to the subcontractor(s)." Please clarify if all Subcontractor Certificates of Competency are required to be submitted with the Bid Solicitation, or if the Bidder may supply the Subcontractor Certificates of Competency to the CRA during the evaluation period, prior to any award of contract.**

   Please refer to the below as stated in the ITB:

   Section 2: Special Terms and Conditions, Subsection 14: Certifications "…If other professions or trades are required in conjunction with this Bid Solicitation and such work and/or services will be performed or provided by a subcontractor(s), an applicable Certificate of Competency issued to the subcontractor(s) shall be submitted with the Bidder's Bid; provided, however, that the CRA may at its option and in its best interest allow the Bidder to supply the subcontractor(s) certificate to the CRA during the evaluation period prior to any award of contract."

   Section 2: Special Terms and Conditions, Subsection 28: Subcontractors of Work Shall be Identified "As part of its Bid, the Bidder must identify any and all subcontractors that will be used in the performance of the proposed scope of work, their qualifications (including any licenses, certifications, etc.), capabilities, experience, and the portion of the work to be done by the subcontractor. The competency of the subcontractor(s) with respect to experience, skill, responsibility and business standing shall be considered by the CRA when making the award in the best interest of the CRA. If the Bidder fails to identify any and all subcontractors in the Bid, the Bidder may be allowed to submit this documentation during the Bid evaluation period, prior to the award of any Contract, at the sole and absolute discretion of the CRA."

   As stated in the ITB, if Subcontractor(s) Certificates of Competency(ies) are not included with the submitted Bid, the CRA may at its option, and at its sole and absolute discretion, allow the Bidder to supply such information during the Bid evaluation period, prior to the award of any Contract.

ADDENDUM NO.3 ATTAC MENTS

1. Geotechnical Report

ORIGINAL COPY

DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY

ADDENDUM NO. 4
TO
INVITATION TO BID NO. CRA 2022-01-R
95 SW 5T AVENUE COMMERCIAL BUILDING CONSTRUCTION

NOVEMBER 7, 2022

TO ALL PROPOSERS AND OT ERS CONCERNED

The Delray Beach Community Redevelopment Agency ("CRA") has heretofore published an Invitation to Bid ("ITB") dated September 6, 2022, with respect to its intent to receive and consider Bids from qualified Bidders to construct a new commercial building located at 95 SW 5th Avenue, Delray Beach, Florida, 33444, ("Project").

The intent of this Addendum is to address questions and/or errors, and to clarify other aspects of the ITB. Bidders submitting Bids for the above-referenced ITB shall take note of the following changes, additions, deletions clarifications, etc., which shall become a part of and have precedence over anything shown or described otherwise.

MODIFICATION

Wherever applicable throughout the ITB document, Bidders are hereby advised that the Bid Submission Due Date and Time has been extended due to impending weather conditions to **W□□□□□□□, N□□□□ □□□16, 2022, □□3 00PM EST**. The location of delivery for the Bids remains the CRA Office located at 20 N Swinton Avenue, Delray Beach, FL 33444.

NOTE

Wherever applicable throughout the ITB document, Bidders are hereby advised that the ITB NO. CRA 2022-01 is now **ITB NO. CRA 2022-01-R**

QUESTIONS

1. Plan sheet **LNP.1** tree disposition chart indicates trees **1, 2** and **3** are to be removed . Plan sheet **AD-100 S**ite **D**emo indicates all **13** trees are to be removed . Please clarify .

   Please follow Tree Disposition Chart on sheet LNP.1

---

2. Can we use **TPO** system as an alternative for the roofing Is there any approved equal manufacturer for the roofing such as **GAF, C**ertainteed or **F**irestone

   A single-ply TPO membrane system is not acceptable for this Project.

   Please provide specified material only. There is no other approved material.

ORIGINAL COPY

BID SUBMITTAL SIGNATURE PAGE

By signing this Bid, the Bidder certifies that it satisfies all legal requirements as an entity to do business with the Delray Beach Community Redevelopment Agency, including all Conflict of Interest and Code of Ethics provisions.

Name of Bidder:

Ahrens Enterprises, Inc. dba AHRENS Companies

Street Address:

1461 Kinetic Road, Lake Park, FL 33403

Mailing Address (if different than Street Address):

Telephone Number(s): (561) 839-2820

Fax Number(s): N/A

Email Address: richard@ahrenscompanies.com

Federal Employer Identification Number: 65-0297589

Prompt Payment Terms: N/A % N/A days' net N/A days

Signature: Richard C. Ahrens

(Signature of Authorized Agent)

Authorized Agent Name: Richard C. Ahrens

Title: President/CEO

By signing this document, the Bidder agrees to all Terms and Conditions of this Bid Solicitation and the resulting Contract/Agreement.

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER TO BE BOUND BY THE TERMS OF ITS OFFER, FOR NOT LESS THAN 90 DAYS, AND THE BIDDER'S UNEQUIVOCAL OFFER TO BE BOUND BY THE TERMS AND CONDITIONS SET FORTH IN THIS INVITATION TO BID. FAILURE TO SIGN THIS BID SOLICITATION WHERE INDICATED ABOVE, BY AN AUTHORIZED REPRESENTATIVE, SHALL RENDER THE BID NON-RESPONSIVE. THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER TO THE TERMS OF ITS OFFER.

ORIGINAL COPY

BID PRICING FORM

1. PRICE
   Bidder shall indicate the firm and fixed price offered to the Delray Beach Community Redevelopment Agency for the work described in this Bid Solicitation.

2. SCHEDULE OF VALUES
   Bidder shall submit a schedule of values supporting the Bid Price.

3. PROJECT COMPLETION
   Bidder agrees that the work will be finally complete **no later than 365 calendar days** from the date of issuance of the Notice to Proceed.

BID PRICE:

$ 2,739,968.00

DOLLAR AMOUNT

Two Million Seven Hundred Thirty-Nine Thousand Nine Hundred Sixty-Eight Dollars and Zero Cents

WRITTEN DOLLAR AMOUNT

Ahrens Enterprises, Inc. dba AHRENS Companies

Bidder Name

Richard C. Ahrens — November 16, 2022

Authorized Agent Signature — Date

Richard C. Ahrens President/CEO

Printed Name and Title

Ahrens Companies

SCHEDULE OF VALUES
Spreadsheet Report
Delray Beach CRA Development

Project name	Delray Beach CRA Development 95 SW 5th Avenue Delray Beach FL 33444 US
Estimator	JM / RCA
Labor rate table	Standard Labor
Equipment rate table	Standard Equipment
Job size	7089 SF
Duration	12 MO
Job cost job number	22-000054
Project	New construction
Report format	Sorted by 'Group phase/Phase' 'Detail' summary Allocate addons

Ahrens Companies

SCHEDULE OF VALUES
Spreadsheet Report
Delray Beach CRA Development

Description	Total Amount
MANAGEMENT & SUPERVISION	
Site Management	
Superintendent	101,928
Project Management	
Project Manager	36,838
Supers Expenses	
SupersTravel	886
Supers Cell Phone	554
Project Manager Expenses	
PM Travel (1x / WK)	1,489
PM Cell Phone	554
Estimating	
Project Estimator	22,158
Project Administration	
Project Administrator	53,180
Quality Control: Testing	
Testing	12,547
TEMPORARY SERVICES	
Temporary Utilities	
Temp Electricity Useage	886
Temp Water Useage	554
Temp Toilet	1,806
Dumpster	7,312
Field Office & Supplies	
Field Office - Deliver & Remove	582
Field Office Trailer	2,969
Procore Software	1,662
IPAD Computer	886
Field Storage	
Storage Trailers	798
Field: Supplies	
Job Photographs / Drone	886
Safety Protection	
First Aid Equip	554
Safety Meetings	886
Security & Const. Fence	
Construction Fence	5,131
SURVEY & CLOSEOUT	
Surveying Services	
Construction Survey Services	8,523
Site Clean-up	
Concrete Wash-out Dumpster Rental	997
Building Clean-Up	
Continuous Clean-up	1,330
Final Cleaning / Office Area	3,313
Punchlist	
Punchlist Items	2,659
SITEWORK	
Sitework	
Mobilization	9,528
Silt Fence/Construction Entrance/Silt Fence Removal	5,373

Ahrens Companies

SCHEDULE OF VALUES

Spreadsheet Report

Delray Beach CRA Development

Description	Total Amount
Sitework	
Maintenance of Traffic	5,540
Demolition & Remove	29,371
Earthwork / Cut / Fill	19,721
Street Sweeping	7,534
Utilities	
Sanitary Sewer	3,795
Storm Drainage	111,191
Water / Fire Line	13,295
Sidewalks	
Concrete/Paver Walks	39,298
Striping and Signage	
Striping / Signage / Bumpers	10,525
Site Furnishings	
Raised Planters	2,216
Bike Rack	770
Landscaping	
Landscaping	18,946
Sod & Seed	
St Augustine Sod	643
Irrigation	
Irrigation System	6,628
CONCRETE	
Concrete	
Monolithic Slab, Foundations/Masonry	589,844
Option for flatwork	16,498
1 set metal pan stair infill	3,767
Bond Fee Concrete	21,528
Precast Architectural Sills	4,963
Precast Joists	127,410
MASONRY	
Masonry	
Masonry / CMU (included in Slab/Foundations)	0
METALS	
Miscellaneous Metals	
Misc Metals	139,819
6" Bollards - Embedded (included on Misc Metals proposal)	2,327
WOOD & PLASTICS	
Wood & Plastics	
Wood Rough Carpentry	1,854
THERMAL & MOISTURE PROT	
Division 7	
Waterproofing - Liquid	31,432
Insulation	
Insulation / Subcontract	13,960
Membrane: BUR Bitumen	
Type I Asphalt 2ply (including LWIC)	180,590
DOORS & WINDOWS	
Doors	
Doors / Frames / Hdwe / Installation	54,386

Ahrens Companies

SCHEDULE OF VALUES
Spreadsheet Report
Delray Beach CRA Development

Description	Total Amount
Metal-Framed Storefronts	
Aluminum Storefronts & Windows includes glass	135,266
FINISHES	
Finishes	
Painting	25,388
Drywall Subcontractor	
Mtl Frmg / GWB / Insul / Dr Frms / Blocking	56,122
Plaster and Stucco Sub	
Stucco	48,084
Flooring Subcontractor	
Flooring (including exterior tile)	53,734
Seal Concrete Floor	1,117
Window Sills	4,121
Acoustical Ceiling	
Acoustical Ceiling	7,135
Specialties	
Signage	
Rooms Signage	2,126
Fire Extinguishers Etc	
Fire Extinguishers	469
Knox Box	
Knox Box	726
Protective Covers	
Canopies	8,831
Bath Accessories	
Bath Accessories	6,858
CONVEYING SYSTEMS	
Elevators	
Elevator Contractor	102,129
MECHANICAL	
Plumbing	
Plumbing	88,237
HVAC	
HVAC	153,549
ELECTRICAL	
Electrical	
Electrical Contractor	183,157
Special Systems	
Lightning Protection Systems	20,386
Fire Alarm	
Fire Alarm	19,134

Ahrens Companies

SCHEDULE OF VALUES
Spreadsheet Report
Delray Beach CRA Development

Estimate Totals

Description	Amount	Totals	Rate	Cost Basis	Cost per Unit
Labor	218,597				30.836 /SF
Material	3,731				0.526 /SF
Subcontract	2,407,939				339.673 /SF
Equipment					
Other	30,919				4.361 /SF
	2,661,186	2,661,186			375.397 /SF
Insurance	31,946		1.330 %	T	4.506 /SF
	31,946	2,693,132			379.903 /SF
Builders Risk Insurance 01-01415	20,580		0.764 %	T	2.903 /SF
Cons Surety Bond 01-01062	26,256			B	3.704 /SF
Total		**2,739,968**			**386.510 /SF**

CONFLICT OF INTEREST DISCLOSURE FORM

The award of this Contract is subject to the provisions of Chapter 112, *Florida Statutes*. All Bidders must disclose within their Bids: the name of any officer, director, or agent who is also an employee of Delray Beach Community Redevelopment Agency ("CRA").

Furthermore, all Bidders must disclose the name of any CRA employee who owns, directly, or indirectly, an interest of more than five percent (5%) in the Bidder's firm or any of its branches.

The purpose of this disclosure form is to give the CRA the information needed to identify potential conflicts of interest for evaluation team members and other key personnel involved in the award of this contract.

The term "conflict of interest" refers to situations in which financial or other personal considerations may adversely affect, or have the appearance of adversely affecting, an employee's professional judgment in exercising any CRA duty or responsibility in administration, management, instruction, research, or other professional activities.

Please check one of the following statements and attach additional documentation if necessary:

X _____ To the best of our knowledge, the undersigned firm has no potential conflict of interest due to any other Cities, Counties, contracts, or property interest for this Bid.

_____ The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest due to other Cities, Counties, contracts, or property interest for this Bid.

Acknowledged by:

Ahrens Enterprises, Inc. dba AHRENS Companies
Bidder Name

Richard C. Ahrens
Authorized Agent Signature

Richard C. Ahrens President/CEO
Name and Title (Print or Type)

November 16, 2022
Date

ORIGINAL COPY

SCRUTINIZED COMPANIES CERTIFICATION PURSUANT TO
***FLORIDA STATUTES* § 287.135**

I, Richard C. Ahrens, on behalf of Ahrens Enterprises, Inc. dba AHRENS Companies,
Print Name and Title — Company Name

certify that Ahrens Enterprises, Inc. dba AHRENS Companies does not:
Company Name

1. Participate in a boycott of Israel; and
2. Is not on the Scrutinized Companies that Boycott Israel List; and
3. Is not on the Scrutinized Companies with Activities in Sudan List; and
4. Is not on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List; and
5. Has not engaged in business operations in Syria.

Submitting a false certification shall be deemed a material breach of contract. The Delray Beach Community Redevelopment Agency ("DBCRA") shall provide notice, in writing, to the Contractor of the DBCRA's determination concerning the false certification. The Contractor shall have ninety (90) days following receipt of the notice to respond in writing and demonstrate that the determination of false certification was made in error. If the Contractor does not demonstrate that the DBCRA's determination of false certification was made in error then the DBCRA shall have the right to terminate the contract and seek civil remedies pursuant to *Florida Statutes* § 287.135.

Section 287.135, *Florida Statutes*, prohibits the DBCRA from:
1) Contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, F.S. or is engaged in a boycott of Israel; and
2) Contracting with companies, for goods or services over $1,000,000.00 that are on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, created pursuant to s. 215.473, or are engaged in business operations in Syria.

As the person authorized to sign on behalf of the Contractor, I hereby certify that the company identified above in the section entitled "Contractor Name" does not participate in any boycott of Israel, is not listed on the Scrutinized Companies that Boycott Israel List, is not listed on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, and is not engaged in business operations in Syria. I understand that pursuant to section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees, and/or costs. I further understand that any contract with the DBCRA for goods or services may be terminated at the option of

the DBCRA if the company is found to have submitted a false certification or has been placed on the Scrutinized Companies with Activities in Sudan list or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List.

Ahrens Enterprises, Inc. dba AHRENS Companies
COMPANY NAME

SIGNATURE

Richard C. Ahrens
PRINT NAME

President/CEO
TITLE

Must be executed and returned with the Bid to be considered.

ORIGINAL COPY

NOTIFICATION OF PUBLIC ENTITY CRIMES LAW

Pursuant to Section 287.133, *Florida Statutes*, you are hereby notified that a person or affiliate who has been placed on the convicted contractors list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases or real property to a public entity, may not be awarded or perform work as a contractor, supplier, sub-vendor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 [F.S.] for Category Two [$35,000.00] for a period of thirty-six (36) months from the date of being placed on the convicted contractors list.

Acknowledged by:

Ahrens Enterprises, Inc. dba AHRENS Companies

Bidder Name

Richard C. Ahrens

Authorized Agent Signature

Richard C. Ahrens President/CEO

Name and Title (Print or Type)

November 16, 2022

Date

PUBLIC RECORDS LAW

Notification of Public Records Law Pertaining to Public Contracts and Requests for Contractor Records Pursuant to Chapter 119, Florida Statutes

Pursuant to Chapter 119, *Florida Statutes*, Contractor shall comply with the public records law by keeping and maintaining public records required by the Delray Beach Community Redevelopment Agency ("CRA") in order to perform the service. Upon request from the CRA custodian of public records, contract shall provide the CRA with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, *Florida Statutes* or as otherwise provided by law. Contractor shall ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract If the Contractor does not transfer the records to the CRA. Contractor upon completion of the contract, shall transfer, at no cost, to the CRA all public records in possession of the Contractor or keep and maintain public records required by the CRA in order to perform the service. If the Contractor transfers all public records to the CRA upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the CRA, upon request from the CRA custodian of public records, in a format that is compatible with the information technology systems of the CRA.

IF T E AWARDED BIDDER AS QUESTIONS REGARDING T E APPLICATION OF C APTER 119, FLORIDA STATUTES, TO T E AWARDED BIDDER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO T IS AGREEMENT, CONTACT T E CUSTODIAN OF PUBLIC RECORDS, C RISTINE TIBBS, AT T E DELRAY BEAC COMMUNITY REDEVELOPMENT AGENCY, 20 N. SWINTON AVE., DELRAY BEAC FLORIDA AND MAY BE CONTACTED BY P ONE AT 561-276-8640 OR VIA EMAIL AT TIBBSC MYDELRAYBEAC .COM.

Acknowledged by:

Ahrens Enterprises, Inc. dba AHRENS Companies
Bidder Name

Richard C. Ahrens
Authorized Agent Signature

Richard C. Ahrens President/CEO
Name and Title (Print or Type)

November 16, 2022
Date

DRUG-FREE WORKPLACE

Ahrens Enterprises, Inc. dba AHRENS Companies is a drug-free workplace and has
(Company Name)
a substance abuse policy in accordance with and pursuant to Section 440.102, *Florida Statutes*.

Acknowledged by:

Ahrens Enterprises, Inc. dba AHRENS Companies
Bidder Name

Richard C. Ahrens
Authorized Agent Signature

Richard C. Ahrens President/CEO
Name and Title (Print or Type)

November 16, 2022
Date

NON-COLLUSION AFFIDAVIT

STATE OF Florida
COUNTY OF Palm Beach

Before me, the undersigned authority, personally appeared Richard C. Ahrens, who, after being by me first duly sworn, deposes and says of his/her personal knowledge that:

a. He/She is President/CEO of Ahrens Enterprises, Inc. dba AHRENS COMPANIES, the Bidder that has submitted a Bid to perform work for the following:

ITB CRA No.: 2022-01 Title: Delray Beach Community Redevelopment Agency (CRA) 95 SW 5th Avenue Commercial Building Construction

b. He/She is fully informed respecting the preparation and contents of the attached Request for Bids, and of all pertinent circumstances respecting such Solicitation.

Such Bid is genuine and is not a collusive or sham Bid.

c. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with the Solicitation and contract for which the attached Bid has been submitted or to refrain from proposing in connection with such Solicitation and contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or any other Bidder, or to fix any overhead, profit, or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the CRA or any person interested in the proposed contract.

d. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Richard C. Ahrens
Signature

Subscribed and sworn to (or affirmed) before me this 16th day of November 2022 by Richard C. Ahrens, who is personally known to me or who has produced _____ as identification.

SEAL

BONNIE S. DANIELS
MY COMMISSION # HH3180
EXPIRES: May 27, 2024

Notary Signature Bonnie S. Daniels
Notary Name: _____
Notary Public (State): _____
My Commission No: _____
Expires on: _____

ORIGINAL COPY

BID BOND

STATE OF FLORIDA)
) SS
COUNTY OF PALM BEACH)

KNOW ALL MY BY THESE PRESENTS that Ahrens Enterprises, Inc. d/b/a Ahrens Companies as Principal, and Berkley Insurance Company as surety, are held and firmly bound unto the Delray Beach Community Redevelopment Agency, Florida, hereinafter called the CRA in the penal sum of Five Percent of Amount Bid dollars ($ 5%) lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas the Principal has submitted the accompanying bid, dated November 9, 2022, for project titled:

95 SW 5th Avenue Commercial Building Construction
Delray Beach Community Redevelopment Agency
ITB CRA No. 2022-01

NOW, THEREFORE,

(a) It is a condition precedent to the submission of said bid that a certified check, cashier's check or bid bond in the amount of five percent (5%) of the base bid be submitted with said bid as a guarantee that Bidder would, if awarded the contract, enter into a written contract with the CRA for the completion of the Work specified in the Contract Documents for the amount indicated in the Bid.

(b) If the Principal shall not withdraw said bond within (90) days after date of the same, and shall within (30) days after the prescribed forms are presented to him for signature, enter into a written contract with the CRA in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligation shall be void and of no effect, otherwise the sum herein stated shall be due and payable to the CRA and the surety herein agrees to pay said sum immediately upon demand of the CRA in good and lawful money of the United States of America as liquidated damages for failure thereof of said principal.

IN WITNESS WHEREOF, the above-bounded parties executed this instrument under their several seals, this 9th day of November, 2022, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

I Brett Rosenhaus, Attorney-in-Fact (person), on behalf of
(surety)
Berkley Insurance Company (Surety Company) have read

and examined the BID BOND attached to Bid No. 2022-01.

Brett Rosenhaus
Signature

Date: November 9, 2022

ORIGINAL COPY

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses required). (If Corporation, Secretary Only will attest and affix seal)

WITNESSES:

Print Name: Denise Wronowski

Print Name: Rose O'Malia

PRINCIPAL

Ahrens Enterprises, Inc. d/b/a Ahrens Companies
(firm name)

By: Richard C. Ahrens
(Signature of Authorized Officer)

(affix Seal)

Print Name: Richard C. Ahrens

Title: President / CEO

Business Address:
1461 Kinetic Road
Lake Park, FL 33403

WITNESSES:

Print Name: Rita Lazarides

Print Name: Stephanie Wall

SURETY:

Berkley Insurance Company
(firm name)

By: Brett Rosenhaus
(Signature, Attorney-in-Fact)

(affix Seal)

Print Name: Brett Rosenhaus, Attorney-in-Fact

Business Address
475 Steamboat Road
Greenwich, CT 06830

Name of Local Insurance Agency

Nielson, Rosenhaus & Associates

ORIGINAL COPY

No. BI-492e

POWER OF ATTORNEY
BERKLEY INSURANCE COMPANY
WILMINGTON, DELAWARE

NOTICE: The warning found elsewhere in this Power of Attorney affects the validity thereof. Please review carefully.

KNOW ALL MEN BY THESE PRESENTS, that BERKLEY INSURANCE COMPANY (the "Company"), a corporation duly organized and existing under the laws of the State of Delaware, having its principal office in Greenwich, CT, has made, constituted and appointed, and does by these presents make, constitute and appoint: ***Brett Rosenhaus or Dale A. Belis of Acrisure, LLC dba Nielson, Rosenhaus & Associates of Delray Beach, FL*** its true and lawful Attorney-in-Fact, to sign its name as surety only as delineated below and to execute, seal, acknowledge and deliver any and all bonds and undertakings, with the exception of Financial Guaranty Insurance, providing that no single obligation shall exceed **One Hundred Million and 00/100 U.S. Dollars (U.S.$100,000,000.00)**, to the same extent as if such bonds had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office in their own proper persons.

This Power of Attorney shall be construed and enforced in accordance with, and governed by, the laws of the State of Delaware, without giving effect to the principles of conflicts of laws thereof. This Power of Attorney is granted pursuant to the following resolutions which were duly and validly adopted at a meeting of the Board of Directors of the Company held on January 25, 2010:

RESOLVED, that, with respect to the Surety business written by Berkley Surety, the Chairman of the Board, Chief Executive Officer, President or any Vice President of the Company, in conjunction with the Secretary or any Assistant Secretary are hereby authorized to execute powers of attorney authorizing and qualifying the attorney-in-fact named therein to execute bonds, undertakings, recognizances, or other suretyship obligations on behalf of the Company, and to affix the corporate seal of the Company to powers of attorney executed pursuant hereto; and said officers may remove any such attorney-in-fact and revoke any power of attorney previously granted; and further

RESOLVED, that such power of attorney limits the acts of those named therein to the bonds, undertakings, recognizances, or other suretyship obligations specifically named therein, and they have no authority to bind the Company except in the manner and to the extent therein stated; and further

RESOLVED, that such power of attorney revokes all previous powers issued on behalf of the attorney-in-fact named; and further

RESOLVED, that the signature of any authorized officer and the seal of the Company may be affixed by facsimile to any power of attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligation of the Company; and such signature and seal when so used shall have the same force and effect as though manually affixed. The Company may continue to use for the purposes herein stated the facsimile signature of any person or persons who shall have been such officer or officers of the Company, notwithstanding the fact that they may have ceased to be such at the time when such instruments shall be issued.

IN WITNESS WHEREOF, the Company has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this 14th day of November, 2019.

Attest:

(Seal)

By _____
Ira S. Lederman
Executive Vice President & Secretary

Berkley Insurance Company

By _____
Jeffrey M. Hafter
Senior Vice President

WARNING: THIS POWER INVALID IF NOT PRINTED ON BLUE "BERKLEY" SECURITY PAPER.

STATE OF CONNECTICUT)
) ss:
COUNTY OF FAIRFIELD)

Sworn to before me, a Notary Public in the State of Connecticut, this 14th day of November, 2019, by Ira S. Lederman and Jeffrey M. Hafter who are sworn to me to be the Executive Vice President and Secretary, and the Senior Vice President, respectively, of Berkley Insurance Company.

MARIA C RUNDBAKEN
NOTARY PUBLIC
CONNECTICUT
MY COMMISSION EXPIRES
APRIL 30, 2024

_____
Notary Public, State of Connecticut

CERTIFICATE

I, the undersigned, Assistant Secretary of BERKLEY INSURANCE COMPANY, DO HEREBY CERTIFY that the foregoing is a true, correct and complete copy of the original Power of Attorney; that said Power of Attorney has not been revoked or rescinded and that the authority of the Attorney-in-Fact set forth therein, who executed the bond or undertaking to which this Power of Attorney is attached, is in full force and effect as of this date.

Given under my hand and seal of the Company, this 9th day of November, 2022.

(Seal)

_____
Vincent P. Forte

WARNING – Any unauthorized reproduction or alteration of this document is prohibited. This power of attorney is void unless seals are readable and the certification seal at the bottom is embossed. The background imprint, warning and **verification instructions** (on reverse) must be in blue ink.

ORIGINAL COPY

Please **verify the authenticity** of the instrument attached to this Power by:

Toll-Free Telephone: (800) 456-5486; or

Electronic Mail: BSGInquiry@berkleysurety.com

Any written notices, inquiries, claims or demands to the Surety on the bond attached to this Power should be directed to:

Berkley Surety
412 Mount Kemble Ave.
Suite 310N
Morristown, NJ 07960
Attention: Surety Claims Department

Or

Email: BSGClaim@berkleysurety.com

Please include with all communications the bond number and the name of the principal on the bond. Where a claim is being asserted, please set forth generally the basis of the claim. In the case of a payment or performance bond, please also identify the project to which the bond pertains.

Berkley Surety is a member company of W. R. Berkley Corporation that underwrites surety business on behalf of Berkley Insurance Company, Berkley Regional Insurance Company and Carolina Casualty Insurance Company.

NIELSON, ROSENHAUS & ASSOCIATES
A NIELSON HOOVER GROUP COMPANY

ACRISURE
AGENCY PARTNER

November 16, 2022

Delray Beach Community Redevelopment Agency
20 N. Swinton Avenue
Delray Beach, FL 33444

RE: Ahrens Enterprises, Inc.
Project: 95 SW 5th Avenue Commercial Building Construction, ITB CRA No. 2022-01

To Whom It May Concern:

This is to advise you that our office provides Bid, Performance, and Payment Bonds for Ahrens Enterprises, Inc. Their surety is Berkley Insurance Company, which carries an A.M. Best Rating of A+ XV and listed in the Department of the Treasury's Federal Register.

Based upon normal and standard underwriting criteria at the time of the request, we should be in a position to provide Performance and Payment Bonds for projects up to $15,000,000 for a single project and $30,000,000 in the aggregate. We obviously reserve the right to review final contractual documents, bond forms and obtain satisfactory evidence of funding prior to final commitment to issue bonds. We cannot assume liability to any third party, including you, if we do not execute said bonds.

Ahrens Enterprises, Inc. is an excellent contractor, and we hold them in highest regard. We feel extremely confident in our contractor and encourage you to offer them an opportunity to execute any upcoming projects.

This letter is not an assumption of liability, nor is it a bid or performance and payment bond. It is issued only as a bonding reference requested by our respected client.

If you should have any questions, please do not hesitate to give me a call.

Sincerely,

Brett Rosenhaus
Florida Licensed Agent

220 Congress Park Drive
Suite 100
Delray Beach, FL 33445
P: 561.454.8210
F: 561.455.4787
W: nielsonbonds.com

SECTION 6: EXHIBITS

Exhibit A: Technical Specifications (Separately Attached)

Exhibit B: Construction Drawings (Separately Attached)

Exhibit C: Property Map and Photos

Exhibit D: Property Summary

Exhibit E: Project Reference Form

Exhibit A: Technical Specifications

Exhibit A is separately attached.

Please remember to separately download Exhibit A – Technical Specifications.

Downloaded & Reviewed

Exhibit B: Construction Drawings

Exhibit B is separately attached.

Please remember to separately download Exhibit B – Construction Drawings

Downloaded & Reviewed

EXHIBIT C: PROPERTY MAP

Project Site is outlined in red.

Project Site Photos

Bidders are encouraged to visit the Project Site on their own time.

EXHIBIT D: PROPERTY SUMMARY

Property Detail

Show Full Map

Nearby Sales Search

Location Address	95 SW 5TH AVE
Municipality	DELRAY BEACH
Parcel Control Number	12-43-46-17-06-029-0280
Subdivision	DELRAY BCH RESUB BLK 29 IN
Official Records Book/Page	22581 / 1328
Sale Date	APR-2008
Legal Description	DELRAY BCH RESUB BLK 29 LT 28 (LESS W 5 FT SW 5TH AVE & TRGLR PAR R/WS) & LT 29 (LESS W 5 FT SW 5TH AVE R/W) BLK 29

Owner Information

Change of Address

Owner(s)	Mailing Address
DELRAY BEACH CRA	20 N SWINTON AVE DELRAY BEACH FL 33444 2632

Sales Information

Sales Date	Price	OR Book/Page	Sale Type	Owner
APR-2008	$215,000	22581 / 01328	WARRANTY DEED	DELRAY BEACH CRA
JUN-2000	$2,061	11825 / 00337	TAX DEED	VASQUEZ VINCENT

NOTE: Sales do not generally appear in the PAPA database until approximately 1 to 3 weeks after the closing date. If a recent sale does not show up in this list, please allow more time for the sale record to be processed.

Exemption Information

Portability Calculator

Exemption Year: 2022

Applicant/Owner	Year	Detail
	2022	

Property Information

Tangible Account(s)

Subarea and Sq. Footage for Building 0		Structural Element for Building 0	Sketch for Building 0
Code Description	Sq. Footage		No Image Found
No Data Found.			

Number of Units	0 View Building Details
Total Square Feet*	0
Acres	0.1716
Property Use Code	8900 - MUNICIPAL
Zoning	CBD - CBD-CENTRAL BUSINESS (12-DELRAY BEACH)

* May indicate living area in residential properties.

Request Structural Details Change

Appraisals

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Improvement Value	$22,876	$23,446	$24,017	$13,099	$12,995
Land Value	$129,629	$129,629	$123,456	$77,160	$59,182
Total Market Value	$152,505	$153,075	$147,473	$90,259	$72,177

All values are as of January 1st each year

Assessed and Taxable Values

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Assessed Value	$105,676	$96,069	$87,335	$79,395	$72,177
Exemption Amount	$105,676	$96,069	$87,335	$79,395	$72,177
Taxable Value	$0	$0	$0	$0	$0

Taxes

Show 5 year | Show 10 year

Tax Year	2021	2020	2019	2018	2017
Ad Valorem	$0	$0	$0	$0	$0
Non Ad Valorem	$78	$78	$78	$78	$78
Total tax	$78	$78	$78	$78	$78

*__Buyers take note:__ Taxes will change and often increase substantially when a property sells. The seller's exemption benefits will GO AWAY the year after they sell and this may result in higher taxes for a buyer. Please use the Property Tax Calculator to get a better annual tax estimate if you are purchasing this property.

Property Tax Calculator | Property Tax Detail | Tax Collector

ORIGINAL COPY

Ron DeSantis, Governor

SECTION 4 - MINIMUM QUALIFICATIONS

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE BUILDING CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

AHRENS, RICHARD C

AHRENS COMPANIES
1461 KINETIC ROAD
LAKE PARK FL 33403-1911

LICENSE NUMBER: CBC006515

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

ORIGINAL COPY

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

Florida dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

HOLT, GERALD PAUL

AHRENS COMPANIES
1461 KINETIC ROAD
LAKE PARK FL 33403

LICENSE NUMBER: CGC025760

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

ORIGINAL COPY

State of Florida
Department of State

I certify from the records of this office that AHRENS ENTERPRISES, INC. is a corporation organized under the laws of the State of Florida, filed on January 9, 1992.

The document number of this corporation is V05323.

I further certify that said corporation has paid all fees due this office through December 31, 2022, that its most recent annual report/uniform business report was filed on April 11, 2022, and that its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

Given under my hand and the Great Seal of the State of Florida at Tallahassee, the Capital, this the Eleventh day of April, 2022

Secretary of State

Tracking Number: 8055742928CU

To authenticate this certificate,visit the following site,enter this number, and then follow the instructions displayed.

https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication

ORIGINAL COPY

FLORIDA DEPARTMENT OF STATE
Division of Corporations

July 17, 2017

AHRENS COMPANIES
1461 KINETIC RD
LAKE PARK, FL 33403

Subject: **AHRENS COMPANIES**
Renewal Number: G17000076141

This will acknowledge the Fictitious Name Registration Renewal for AHRENS COMPANIES, filed on July 17, 2017. This renewal continues the original registration number - G07057700136 until December 31, 2022.

If the mailing address of this business changes, please notify this office in writing, or through the link provided on our website www.sunbiz.org for Address & FEI/EIN Changes. Please reference the original registration number.

Should you have any questions regarding this matter you may contact our office at (850) 245-6058.

Cathy A Carrothers
Reinstatement Section
Division of Corporations

Letter No. 217A00014385

ORIGINAL COPY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

2601 BLAIR STONE ROAD
TALLAHASSEE FL 32399-0783

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto www.myfloridalicense.com. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!

Florida dbpr
STATE OF FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CBC006515 ISSUED: 08/17/2022
CERTIFIED BUILDING CONTRACTOR
AHRENS, RICHARD C
AHRENS COMPANIES

Richard C. Ahrens
Signature

LICENSED UNDER CHAPTER 489, FLORIDA STATUTES
EXPIRATION DATE: AUGUST 31, 2024

Ron DeSantis, Governor Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

LICENSE NUMBER: CBC006515 **EXPIRATION DATE: AUGUST 31, 2024**

THE BUILDING CONTRACTOR HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

AHRENS, RICHARD C
AHRENS COMPANIES
1461 KINETIC ROAD
LAKE PARK FL 33403-1911

ISSUED: 08/17/2022

Always verify licenses online at MyFloridaLicense.com
Do not alter this document in any form.
This is your license. It is unlawful for anyone other than the licensee to use this document.

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name: Ahrens Enterprises, Inc. dba AHRENS Companies
Reference Project Name: Palm Beach Gardens Tennis Clubhouse
Reference Project Location: 5110 117th Ct N. Palm Beach Gardens, FL 33418
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
AHRENS was the General Contractor on the project.
Compensation for Services Provided: $3,680,715.41
Reference Project Start Date and Completion Date: December 3rd, 2019 start
November 30, 2020 completion
Reference Project Construction Cost: $3,423,065.33
Reference Project Construction Start Date and Completion Date: December 3rd, 2019 Start
November 30, 2020 completion
Reference Project Completed on Time and Within Budget: Yes
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Jerry Holt, Project Manager / Roland Holt, Superintendent. Yes they may be invoved in this project
Reference Project Contact Information
Contact Name and Title: Todd Engle, City Engineer
Company/Organization: City of Palm Beach Gardens
Phone and Email: 561-804-7012 tengle@pbgfl.com

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: Richard C. Ahrens

Authorized Agent Name and Title: Richard C. Ahrens, President/CEO

Date: November 16, 2022

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name: Ahrens Enterprises, Inc. dba AHRENS Companies
Reference Project Name: Coral Springs 40/Advanced Equipment
Reference Project Location: 12070 nw 40th Street, Coral Springs, FL 33065
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
AHRENS performed Desing/Build services.
Compensation for Services Provided: $1,865,000.00
Reference Project Start Date and Completion Date: October 2019 Start
June 2020 Completion
Reference Project Construction Cost: $1,743,000.00
Reference Project Construction Start Date and Completion Date: October 2019 Start
June 2020 Completion
Reference Project Completed on Time and Within Budget: Yes
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Jerry Holt, Project Manager / Brian Will Superintendent. Jerry Holt will be the Project Manager.
Reference Project Contact Information
Contact Name and Title: Patricia & Victor Osario, Owner
Company/Organization: Advanced Equipment
Phone and Email: 954-847-1895 victor.desousa@advancees.com

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: Richard C. Ahrens

Authorized Agent Name and Title: Richard C. Ahrens, President/CEO

Date: November 16, 2022

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name: Ahrens Enterprises, Inc. dba AHRENS Companies
Reference Project Name: Bobcat of Treasure Coast
Reference Project Location: 4405 Prosperity Drive, Ft. Pierce, FL 34981
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
AHRENS Performed Design/Build Services for this project.
Compensation for Services Provided: $1,025,350.00
Reference Project Start Date and Completion Date: April 2022 Start
February 2022 Completion
Reference Project Construction Cost: $885,300.45
Reference Project Construction Start Date and Completion Date: April 2022 Start
February 2022 Completion
Reference Project Completed on Time and Within Budget: YES
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Jerry Holt / Carl Leuck Jerry Holt will be the Project Manager for this project.
Reference Project Contact Information
Contact Name and Title: Simon Smith, President
Company/Organization: Bobcat of Treasure Coast
Phone and Email: 561-689-9880 Ext 210 simon@smithb.com

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: Richard C. Ahrens

Authorized Agent Name and Title: Richard C. Ahrens, President/CEO

Date: November 16, 2022

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name: Ahrens Enterprises, Inc. dba AHRENS Companies
Reference Project Name: Plantation Police Dept Training Facility
Reference Project Location: 451 NW 70th Terrace, Plantation, FL 33317
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
AHRENS performed Design Build services.
Compensation for Services Provided: $5,568,356.00
Reference Project Start Date and Completion Date: June 2019 Start
August 2021 Completion
Reference Project Construction Cost: $5,178,571.08
Reference Project Construction Start Date and Completion Date: June 2019 Start
August 2021 Completion
Reference Project Completed on Time and Within Budget: Yes
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Jerry Holt / Carl Lueck Jerry Holt will be the Project Manager
Reference Project Contact Information
Contact Name and Title: Jim Borrelli / Project Manager
Company/Organization: City of Plantation
Phone and Email: 954-658-4291 jborrelli@plantation.org

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: Richard C. Ahrens

Authorized Agent Name and Title: Richard C. Ahrens, President/CEO

Date: November 16, 2022

EXHIBIT E: PROJECT REFERENCE FORM

The Bidder shall complete the following information for a previously completed or currently ongoing project/work within the stipulated time, where the Bidder believes said project/work is of equal or greater scope, size, and complexity that best represents its ability to complete the "Project." The reference provided below should be for one (1) reference project and must comply with the requirements listed in the ITB.

FAILURE TO COMPLETE AND SUBMIT THIS FORM MAY RESULT IN THE PROPOSAL BEING REJECTED AS NON-RESPONSIVE.

Bidder Name: Ahrens Enterprises, Inc. dba AHRENS Companies
Reference Project Name: Kenworth Office & Maintenance Facility
Reference Project Location: Industrial Way, Riviera Beach, FL 33408
Description of Bidder's Role on Reference Project and Services Provided. Please use an additional sheet (one page max), if necessary:
AHRENS performed Construction services for this project with advisory services to the Architect.
Compensation for Services Provided: $2,000,00.00
Reference Project Start Date and Completion Date: September 2018 Start
May 2019 Completion
Reference Project Construction Cost: $1,860,000.00
Reference Project Construction Start Date and Completion Date: September 2018 Start
May 2019 Completion
Reference Project Completed on Time and Within Budget: Yes
Indicate the Bidder's team members and their roles and responsibilities on the Reference Project and whether they will be involved in the Project related the CRA's ITB. Please use an additional sheet (one page max), if necessary.
Jerry Holt / Roger Hawthorne Jerry Holt will be the Project Manager
Reference Project Contact Information
Contact Name and Title: Bob Dollar, President
Company/Organization: Truck Realty Group
Phone and Email: 954-931-9901 bdollar@truckmax.com

Bidder's Certification of Information

By signing below, I acknowledge that the CRA reserves the right to contact the above-named Reference Project Contact and I certify that all information stated above is true and correct to the best of my knowledge.

Authorized Agent Signature: Richard C. Ahrens
Authorized Agent Name and Title: Richard C. Ahrens, President/CEO
Date: November 16, 2022

THE AHRENS ADVANTAGE

OUR SERVICES
Ahrens Companies project team has a proven track record successfully completing several different types of projects including butnot limited to: industrial/manufacturing facilities, gymnasiums, private FBO and airport hangars, office buildings, marinas, golf maintenance buildings, equestrian arenas, educational and training facilities, medical offices, emergency response facilities, and retrofitting.

Why Choose Ahrens Companies?

Cost Conscious Design-Build

Our Design professionals are committed to cost- conscious designs using an efficient approach to the architectural and planning process that generate innovative design-buildsolutions and exceed client expectations.
We provide our own in- house architects and building erection crew; allowing more control in the field which saves costs and reduces production time; a greatset of benefits which all gets passed along to our clients.

Our Legacy Since 1902

The Ahrens family has servedthe community of South
and Central Florida in the construction industry since1902.
We pride ourselves on our commitment to family and community to always provide high quality design- build and general contracting services toprivate clients and governmentagencies throughout Florida.

Our Relentless Pursuit

We pride ourselves on our ability tolisten to our clients and earn their trust through long- lasting relationships and value- added services.
We believe that there is no problem too big to overcome. In fact, we do not see problems but instead face challenges that present opportunities for us to grow and advance with each challenge we overcome.
We make it our top priority to meetclient deliverables on time and under budget.

SINCE 1902
AHRENS
DESIGN/BUILD • GENERAL CONSTRUCTION

STATEMENT OF CAPABILITIES

AHRENS Companies is in the best posture to successfully execute this project for a multitudeof reasons.

- **O□□E□□□□□□□□□** AHRENS Companies has been in business for over 29 years and asa generational family owned and operated business, we have served South Florida in the construction industry for over 118 years. We have successfully completed various municipal recreational facility buildings within Broward and Palm Beach County.
- **E□□□□□□□□□ T□□□** Our team is an experienced group of professionals with various backgrounds in architectural design, engineering and construction all seasoned and trained to solve problems and perform within a holistic integrated approach. Our in- house architects and internal erection division gives us the diversity needed to have an edge over the typical design-build firm and allows for deeper integration throughout ourflexible and seamless design-build process. As a design-build company this integration between design, document production and construction are intrinsically structured to provide the best possible solution from the beginning of the project thru substantial completion. In addition, we have vast experience individually and as a TEAM regarding green buildings and sustainable strategies implementation.
- **U□□□□□□□□□□□□ □□P□□□□□S□□□□** We recognize the importance of public buildings offering activities to the community. The main goals of these types of buildings comes from different perspectives and typically include flexibility of activities, minimizing maintenance and operating costs, general life cycle cost and bringing added value to the community from both the functional aspect as well as the intended social interaction.
- **I□□□□□□□□ D□□□□□** Pre-engineered Building Systems allow implementation of several benefits when compared with traditional construction. With a single component like IPS roof or wall panels the energy efficiency is quite superior. One component supplies the thermal properties, finishes, moisture resistance, air barrier and acoustic qualities that traditional construction needs to provide using different materials as assembly. IPS roofand wall panels is not only cost effective; simultaneously, this technology allows for shorter construction time-period and supports LEED goals. Today's Pre-engineered Building Systems technology can mimic any type of traditional building appearance and also support the development of a more functional and efficient use of space within floorplans.
- **V□□□□ E□□□□□□□□** Our unique design-build method fosters innovation in design as all experts from conceptual design through to construction closeout are involved in the process from the beginning. We continuously analyze the cost of the project under the value engineering methodology. We analyze the functionality of the building, its constructability comparing the best materials cost life cycle, low maintenance durability qualities, sustainable properties, technological improvements, labor, and time variables. We assess these components to assure there is no compromising on aspects like aesthetics or quality when compared to traditional construction systems. All these variables are studied and discussed amongst the team to get a potential cost savings using the best solutions for top building performance. As we have already taken the time to complete preliminary value engineering on this project, you will see our recommendations for cost savings to meet the City's budget included in this proposal.
- **C□□□□F□□□□** Our approach places the client at the forefront of all activities, allowing our team to fully understand and meet client needs throughout all phases. We take the time to listen and truly understand your vision and work relentlessly to make it a reality.

ORIGINAL COPY

CORPORATE QUALIFICATIONS AND CAPABILITIES

CAGE CODE: 5FEM4 Duns: 703003005 EIN: 65-0297589

INCORPORATED IN THE STATE OF FLORIDA - January 1992

State of Florida Building Contractor Lic # CBC 006515
State of Florida General Contractor Lic # CGC 025760
State of Florida Architect Corporation Lic # AR 96626

NAICS CODES:

236210 - Industrial Building Construction
236220 - Commercial and Industrial Building Construction
237990 - Other Heavy and Civil Engineering Construction

AREAS OF EXPERTISE:

- Design - Build
- Value Engineering
- General Contracting
- Construction Management at Risk
- Pre-Engineered Building System
- Construction Management - Cost Plus
- Commercial and Industrial Construction
- Construction Planning and Scheduling
- Safety and Compliance

EXPERIENCE

Ahrens Companies is a leading provider of Design-Build, construction management, and general contracting services to private clients and government agencies in the State of Florida. We have operated in South and Central Florida since 1992 as a licensed architect and general contractor.

Whether we are consulting, conceptually designing, working on a construction jobsite or handling day-to-day operations, we provide our clients with innovative teams of experienced construction professionals that deliver successful projects within budget and on time.

We pride ourselves on our ability to listen to our clients and earn their trust through long-lasting relationships and value-added services. Whether we are ensuring the sustainable construction of their facilities to respond to natural disasters or analyzing a facility's efficiency, we believe in responsive and deliberate actions.

ORIGINAL COPY

Our Design professionals are committed to cost-conscious designs. Our efficient approach to architectural and planning challenges has generated innovative design-build solutions successfully used in many of our projects. The track record of our design department demonstrates our ability to produce imaginative, cost-effective designs in a timely and professional manner.

Ahrens Companies project team has a proven track record and has successfully completed multi-million-dollar projects through detailed task coordination, well-developed partnerships and built solid relationships with the project team.

We are committed to:

- Staying On Schedule
- Being Responsive
- Upholding Safety Standards and Procedures
- Providing a Quality Trained Staff
- Communicating Effectively
- Providing Fair and Competitive Pricing
- Building Strong Relationships with Governmental Agencies
- Cost Effect Methods of Design & Operation
- Meeting & Exceeding Industry Standards
- Innovative Design

PARTIAL LIST OF ACCOMPLIS MENTS

- Design/Build – 39,410 SF two-story emergency response operations center with offices, workshops, amenities, six (6) maintenance bays, self-sustaining CAT 5 pre-engineered steel system with installed wall panels for City of Palm Beach Gardens, FL.

- Constructed - 14,402 SF traditional construction (masonry, bar joists) with laminated wood beam. The facility has services for tennis players (lockers, bathrooms) full amenities (restaurant, retail, fitness) and multipurpose rooms with extending viewing terrace for City pf Palm Beach Gardens, FL.

- Design/Build - Four (4) 15,000 SF Aircraft Manufacturing Hangars A, B, C and D for City of Sebastian, FL.

- Design/Build - 9,300 SF pre-engineered building system self-sustaining hybrid conventional construction with 3-sets of rapid release bi-fold doors. Fuel islands, triage evaluation area emergency response facility utilizing advanced materials accenting constructability, energy, and cost savings operations of Fire Rescue #2 for City of Palm Beach Gardens, FL.

- Constructed - 3,220 SF pre-engineered building system for police/fire tactical training facility for City of Coral Springs, FL.

- Design/Build – 16,524 SF pre-engineered building system 20ft eave height with block accent perimeter walls with offices, parts storage, repair and maintenance facilities for Truck Realty Group in Fort Pierce, FL.

- Design/Build - 30,800 SF addition of 2-story classroom and gymnasium to an existing educational facility. Building is completely solar powered and energy autonomous featuring frameless glass partitions between classrooms and exposed bar joist duct work for a modern industrial look and feel. The Greene School is located in West Palm Beach, FL.

- Design/Build – 23,000 SF mixed-use 3-story entertainment, retail, fitness, and support 2-buildings complex providing indoor and exterior amenities for truck drivers and truck maintenance support along with 174 custom truck parking area with electrical charges.

- Design/Build - 40,304 SF multi-purpose recreational/gymnasium facility utilizing a combination of pre-engineered building system and CBS construction for Mullins Park in the City of Coral Springs, FL.

- Design/Build - 2 story 19,113 SF Corporate office/hangar facility designed for 200 MPH rated (3-second gusts) wind load capacity and renovation of 20,066 SF adjoining office building in Ft. Lauderdale, FL.

- Design/Build - 30,000 SF addition to an existing Budweiser distribution facility, including retro-roofing 3 sections of their 100,000 SF facility and renovating the complete exterior and interior of a 2-story office facility for Southern Eagle Distribution in Ft. Pierce, FL.

- Design/Build - 74,250 SF Equestrian Arena at the St. Lucie County Fairgrounds for St. Lucie County.

- Value Engineered/Redesign of a 40,000 SF CBS structure which was converted to a 137 feet high pre-engineered building containing 12 silos saving the client over 40% over the original design cost. Each silo held 150,000 pounds of aggregate. Demolished existing aggregate plant and constructed new interior restrooms and lounge. This entire project was completed while daily operations of the plant were in progress with over 100 truck movements per day for Bonsal Aggregate in Pompano Beach, FL.

- Design/Build - Five (5) Aviation Hangars consisting of 106,432 SF with attached office/lobbies consisting of 30,731 SF. Project is on 16 acres and hangars are designed to handle Air- Buses and Boeing Business Jets. All hangars are designed to allow maintenance work and have foam fire suppression systems. Turnberry Associates in Opa Locka, FL.

- Constructed - (5) Building Youthful Offender Facility totaling 92,220 SF in Pahokee, FL. This was a joint venture with Wackenhut Corporation.

- Design/Build – 8,400 SF pre-engineered metal building with ICF (Insulated Concrete Forms) walls system for Navy Seals Museum Addition in Ft. Pierce, FL.

- Constructed - 48,540 SF pre-engineered steel building with 2-story offices for Sikorsky Aircraft Corporation Helicopter Hangar in Jupiter, FL.

- Design/Build – 14,600 SF pre-engineered metal building vehicle maintenance facility for Southern Waste Systems in Lantana, FL.

- Design/Build – 5,550 SF pre-engineered metal building emergency response police and fire rescue facility in Abacoa for Palm Beach County, FL.

ORIGINAL COPY

SERVICES

Design-Build:

Ahrens Companies understands the dependent relationship between the designer and the contractor. We bring a single point of contact for the entire building process from planning to design and construction ending with post-occupancy services. Our goal is to provide every Ownerwith the product they envision on time and under budget, at the highest level of quality available.

Our in-house design team provides a holistic approach to the projects, regarding Architecture, Interior Design and Sustainable Design Strategies, working closely with the Construction Management Team throughout.

With our registered Architects, Engineers and Designers, we provide complete building design services from the pre-planning phase through final design and construction as well as post-design consultation on a variety of building types.

Our Design-Build services include:

- Consultation
- Project Valuation
- Feasibility Study Reporting
- Site Plan Development
- Value Engineering
- Architectural & Interior Design
- Sustainable Design (Green Building / LEED)
- Construction Documents
- Permitting

General Contracting:

We take technical proficiency, budget adherence and scheduling as metrics for each project. Scheduling the right equipment and the right team for each job, coupled with technical and disciplined managers is a cornerstone of our vast and successful construction portfolio.
By analyzing all aspects of a project with our team, we know how choices in one area affect another. This enables us to deliver an accurate and completely coordinated estimate.

Our Pre-Construction services include:

- Conceptual and Final Estimating
- Budget Development
- Value-Added Engineering
- Schedule Development
- Continuing Operations Planning
- Document Review
- Development Proformas for Financing

AHRENS SINCE 1902
DESIGN/BUILD • GENERAL CONSTRUCTION

ORIGINAL COPY

PRO ECT TYPES

- Public Works Facilities
- Industrial Manufacturing/Warehousing Facilities
- Gymnasiums
- Private FBO
- Airport Hangars
- Office Buildings
- Marinas
- Golf Maintenance Buildings
- Equestrian Arenas
- Educational And Training Facilities
- Parks and Recreational
- Sporting Facilities
- Club Houses
- Restaurants
- Retail Space
- Medical Offices
- Emergency Response Facilities
- Retrofitting

Rarely are scope and budget in balance at the beginning of the design. Once we thoroughly understand the goals of the project, we will detail the workable options to maximize the program. This "value engineering" is often described as dollars saved, but it in fact serves a larger purpose: cost-effective evaluation of long and short-term options ensuring the comfort and efficiency of the user.

By monitoring changes as the design is developed, our reports highlight the line-item differences in scope, and their cost impact to the overall budget. Designs are evaluated and changes implemented to accommodate budgetary constraints.

We will evaluate the construction documents for completeness, ability to achieve product quality, and construction logistics. In other words, we look at the details from a builder's perspective, supporting, but not assuming the duties of the designer. By identifying conflicts and problem areasup front, we reduce the number of changes and limit delays and additional costs to the project.Working from an extensive and continually updated database of costs, coupled with years of experience with various building types and markets, we know what a specific project should cost.

Our Construction services include:

- Total Quality Management (TQM)
- Project Management and Supervision
- Cost Control
- Safety Program
- Scheduling
- Project Closeout

Q□□□□□ C□□□□□M□□□□□□ □□□

Preparatory meetings are held prior to performing work to establish responsibilities, contract requirements, scheduling, hazards involved, and proper safety required in completing each definable feature of work. Initial and follow-up inspections are conducted during each activity to assure all quality standards are maintained. Final inspections are conducted upon completion of each work phase to assure compliance. Risks must be continually reviewed, and processes developed. Policies and procedures that reinforce these values must be communicated.

Our Post-Construction services include:

- Building / Facility Manuals
- Warranty Service
- Post Occupancy Reports

Sustainable Design:
The LEED certified professionals on our team will know what eco-friendly green principles may be

applicable to your site, thus selecting the improvements which fit your Return-on-Investment requirement.

AHRENS IS THE PERFECT CHOICE!!

AHRENS COMPANIES IS A PASSIONATE DESIGN-BUILD TEAM OF PROFESSIONALS AND EXPERTS, COMMITTED TO COST-CONSCIOUS DESIGN AND CONSTRUCTION, USING AN INTEGRATED METHODOLOGY TO PROVIDE THE MOST EFFICIENT FINAL RESULT MAXIMIZING BENEFITS FOR OUR CLIENTS.

INNOVATION, SUSTAINABILITY AND CLIENT ORIENTED COMPANY CULTURE ARE OUR ADDED VALUE SERVICES.

TEAM AHRENS, WE LOVE WHAT WE DO!!

RICHARD C. AHRENS

Chief Executive Officer/President

Extensive business experience and education has allowed Richard to develop a firm foundation from which to base logical and fundamentally sound development decisions. Since 1969, he has been involved in the design and construction of projects ranging in size from 20,000 to 200,000 square feet for such firms as Frito-Lay, National Gypsum Corporation, Southern Waste Systems, Grumman Aerospace, Bonsal Corporate, Matheson Tri-Gas, Fontainebleau Aviation, Sierra Business Park, Florida Power & Light, Palm Beach Gardens Fire Station #3, Abacoa Fire Rescue Station #16, Coral Springs Police/Fire Tactical Training Facility, Solid Waste Authority, Palm Beach Gardens Golf/Tennis/Public Words, Sebastian Municipal Airport Hangars A, B, C, & D, Sikorsky projects, MRO Hangar St. Lucie County, Plantation Police Department, and the Navy Seal Museum Expansion in Ft. Pierce.

He also has gained great experience in dealing with governmental authorities such as environmental agencies, planning/zoning departments & city councils

KEY EXECUTIVE MANAGEMENT SKILLS

- **Team development and training.**
- **Building and maintaining professional relationships.**
- **Strategic planning and implementation.**
- **Supply chain management.**
- **Exceeding goals and objectives.**
- **Project management from conception to completion.**
- **Navigating organizations to success.**
- **Mergers and acquisitions.**
- **E-commerce and general management.**

EDUCATION & PROFESSIONAL AFFILIATIONS

- Chairman of the Town of Lake Park Planning and Zoning
- President's Advisory Board of the Cornerstone Building Brands Metallic Building Systems Division
- University of Florida, Gainesville, Florida 1969 - B.S. Business Administration
- Licensed Building Contractor, CB – C006515, State of Florida Affiliation
- Sigma Alpha Epsilon Fraternity, University of Florida All American Swimmer
- Treasurer and NCAA Compliance officer for the University of Florida Alumni Swim Team
- Board of Directors of the University of Florida Gator Booster board member
- Advisory Council Member of the University of Florida M.E. Rinker School of Building Construction
- University of Florida Real Estate Advisory Board Member
- Past Advisory Member to the President of Republic Steel Corporation
- Past Advisory Member to the President of Kirby Building Systems and A & S Building Systems and United Structures of America
- Past Building Code Advisory Board member – Palm Beach County
- Founding member of the Palm Beach County Business Development Board, Economic Development council member of St. Lucie County

ORIGINAL COPY

RESUME AND QUALIFICATIONS

GERALD HOLT

GENERAL CONTRACTOR - CONSTRUCTION MANAGER

- Proven expertise in estimating and project management in both general contracting and subcontracting.
- Adept in all facets of staff leadership, business management/development, organizational collaboration, bidding and contract negotiation.
- Skilled in providing highly accurate estimates covering all facets of supplies, time, equipment and necessary personnel.
- Outstanding management capacity developed through managing a successful business.
- Florida Contractors License #CGC 025760.
- Consistently meet/exceed stringent time/budget deadlines while achieving highest quality standards.
- Knowledgeable in code/regulatory compliance requirements and needed documentation.
- Self-motivated, self-directed individual skilled in troubleshooting and problem-solving.
- Maintain positive relations with Developers, Architects, Engineers, Owners and Sub-Contractors.
- B.A. Degree in Biology from University of South Florida.

Project Manager, Ahrens Companies, Inc. - HIGHLIGHTED PROJECTS

Palm Beach Gardens Operations Center
This new Design-Build Operations Center is a 39,410 S.F. facility featuring administrative offices, breakrooms and multiple maintenance bays that house the City of Palm Beach Gardens Public Works Department. While currently under construction, this project has an estimated completion date of June 2019.

Big Daddy's Package Store and Flanigan's Restaurant
Project Superintendent overseeing the new construction of a 3,000-sf package liquor store on vacant lot in conjunction with the renovation of the existing Flanigan's Restaurant on the adjacent site. Unique duties consist of orchestrating the demolition of portions of the existing restaurant and preparation of new site and construction of a free-standing package store. Orchestrating the simultaneous expansion and construction of existing restaurant. Typical responsibilities of scheduling subcontractors, facilitating logistics, and maintaining communication with the project manager regarding scheduling and inspection coordination.

Palm Beach Garden's Fire Station #2
Project Superintendent responsible for the site development and construction of a new 9,000 sf foot LEED Silver, 3 bay, emergency operation fire rescue facility in conjunction with concurrent operations of existing facilities at the site. Followed by the overseeing of the demolition and site improvements of the old fire station. Duties included weekly coordination meeting with the City of Palm Beach Gardens, subcontractors, and maintaining schedules with subcontractors, City engineer and inspectors.

OTHER SKILLS
- Deliver oversight and general management to this construction venture.
- Provide all estimating, scheduling, bonding, certified payrolls, bookkeeping and bidding services.
- Direct construction projects and collect on customer invoices.
- Ensure attainment of critical quality objectives.
- Facilitate strategic planning and business development in a competitive and very challenging economy.

SINCE 1902
AHRENS
DESIGN/BUILD • GENERAL CONSTRUCTION

FOR: Ahrens Enterprises, Inc. d.b.a. Ahrens Companies

PROJECT NAME : DELRAY BEACH CRA DEVELOPMENT

LOCATION: PALM BEACH COUNTY

Type of Work	Name	Phone Number	Address
Material Testing	Pacifica Engineering Services, LLC	561-419-9754	601 N Congress Avenue - Suite 303, Delray Beach, FL 33445
Surveying	Caulfield & Wheeler, Inc.	561-392-1991	7900 Glades Road, Suite 100 Boca Raton FL, 33434
Final Cleaning	Filthy Clean Cleaning Services, LLC	407-737-0777	6839 Narcoossee Road Suite 42 Orlando FL, 32822
Temporary Fence	Smith Fence	305-720-9024	3450 SW 49th Way, Davie, FL 33314
Sitework	Talel Developments	954-913-3936	2787 E Oakland Park Blvd Unit 215 Fort Lauderdale FL, 33306
Utilities	Talel Developments	954-913-3936	2787 E Oakland Park Blvd Unit 215 Fort Lauderdale FL, 33306
Irrigation	Xtreme Landscaping	954-825-5749	1685 N Florida Mango Rd, West Palm Beach, FL 33409
Landscaping	Schulz Landscape Service Inc.	954-596-0600	10 Helwig Terrace Deerfield Beach, Fl 33064
Shell Contractor	LTI Construction & Development Co Inc.	561-296-1193	3570 Consumer Street Suite 3 WPB FL 33404
Precast Joist	Structural Prestressed Industries, Inc.	305-556-6699	11405 NW 112 CT Medley, FL 33178
Misc. Metal	SGA Management Inc	786-294-0085	1368 NW 78 Ave Miami Fl 33126
Roofing	Latite Roofing & Sheet Metal,LLC.	954-772-3446	2280 West Copans Road Pompano Beach, Florida 33069
Insulation	PDG Construction	305-668-9772	7105 SW 8 St. suite 405-404 Miami, fl 33144
Waterproofing	MCW Restoration Services LLC	954-974-0770	1100 SW 30 Ave. Pompano Beach, FL 33069
Doors	Precision Building Products Inc	561-734-0695	3300 S Congress Ave # 7, Boynton Beach, FL 33426
Storefronts	Miller Glass & Glazing Inc	954-784-6601	100 Park Central Blvd. South Pompano Beach, FL 33064
Acoustic Ceiling	Commercial Ceiling Design, Inc	954-931-4346	1520 69th Way Hollywood, FL 33024
Drywall	K&S Interiors, Inc.	561-848-5300	2000 Avenue P., Suite 15 Riviera Beach, FL. 33404
Flooring	Twin Flooring Inc	954-825-8120	10886 NW 9th Manor Coral Springs, FL 33071
Painting	TWG Enterprises	561-276-5440	605 SE 1st Avenue, Suite G Delray Beach, FL 33444
Stucco	Welch Plastering, Inc.	561-736-3515	716 N.E. Third Street Boynton Beach, FL 33435
Aluminum Awnings	Southern Awning, Inc.	561-586-0464	313 south H Street Lake Worth Beach, FL 33460-4434
Bathroom Accessories	All Specialty Sales, Inc	954-568-9411	1580 NE 36th Street Fort Lauderdale, FL 33334
Fire Extinguisher	Pye-Barker Fire & Safety, LLC	305-592-3011	2924 NW 109 Avenue Doral, Florida 33172
Sign	Fastsigns of Hollywood	305-498-9207	2841 Hollywood Blvd. Hollywood, FL 33020
Conveying - Elevator	TK Elevator Corporation	561-791-4342	7567 Central Industrial Drive Riviera Beach, FL 33404
HVAC	Klimate Air LLC	954-330-7644	7315 NW 48th Court Lauderhill FL, 33319
Plumbing	Carhart Plumbing Inc.	561-718-4383	10710 151st Ln N Jupiter, FL 33478
Electrical	Langer Electric Service Company	954-984-8489	6500 NW 21 Avenue Suite #1 Fort Lauderdale, FL 33309
Fire Alarm	MariTech Systems, Inc.	954-447-1200	2114 N Flamingo Rd #1146 Pembroke Pines, Florida 33028
Lightning Protection	Bonded Lightning Protection	561-746-4336	2080 W. Indiantown Road, Suite 100, Jupiter, FL 33458

Delray Beach CRA Development

Project name	Delray Beach CRA Development 95 SW 5th Avenue Delray Beach FL 33444 US
Estimator	JM / RCA
Labor rate table	Standard Labor
Equipment rate table	Standard Equipment
Job size	7089 SF
Duration	12 MO
Job cost job number	22-000054
Project	New construction
Notes	
Report format	Sorted by 'Group phase/Phase' 'Detail' summary Allocate addons Print sort level notes

Description	Notes	Total Amount
MANAGEMENT & SUPERVISION		
Site Management		
Superintendent		101,928
Project Management		
Project Manager		36,838
Supers Expenses		
SupersTravel		886
Supers Cell Phone		554
Project Manager Expenses		
PM Travel (1x / WK)		1,489
PM Cell Phone		554
Estimating		
Project Estimator		22,158
Project Administration		
Project Administrator		53,180
Quality Control: Testing		
Testing		12,547
TEMPORARY SERVICES		
Temporary Utilities		
Temp Electricity Useage		886
Temp Water Useage		554
Temp Toilet		1,806
Dumpster		7,312
Field Office & Supplies		
Field Office - Deliver & Remove		582
Field Office Trailer		2,969
Procore Software		1,662
IPAD Computer		886
Field Storage		
Storage Trailers		798
Field: Supplies		
Job Photographs / Drone		886
Safety Protection		
First Aid Equip		554
Safety Meetings		886
Security & Const. Fence		
Construction Fence		5,131
SURVEY & CLOSEOUT		
Surveying Services		
Construction Survey Services		8,523
Site Clean-up		
Concrete Wash-out Dumpster Rental		997

Description	Notes	Total Amount
Building Clean-Up	Post construction cleaning as per specifications section 01 70 00.	
Continuous Clean-up		1,330
Final Cleaning / Office Area		3,313
Punchlist		
Punchlist Items		2,659
SITEWORK		
Sitework	As per civil plans.	
Mobilization		9,528
Silt Fence/Construction Entrance/Silt Fence Removal	6' high fence around construction site; equip with vehicular and pedestrian gates with locks as per specifications section 01 50 00.	5,373
Maintenance of Traffic		5,540
Demolition & Remove		29,371
Earthwork / Cut / Fill		19,721
Street Sweeping		7,534
Utilities		
Sanitary Sewer		3,795
Storm Drainage		111,191
Water Line		13,295
Sidewalks		
Concrete/Paver Walks		39,298
Striping and Signage		
Striping / Signage / Bumpers		10,525
Irrigation Systems		
Irrigation System	Hunter Irrigation System. Lateral Line - Ductile Iron Class 350. Mainline – PVC sched 40. Pipe Sleeve – PVC class 200 as per irrigation plans. IRR.1 – 2.	6,628
Site Furnishings		
Raised Planters		2,216
Bike Rack	As per plans architecture site plans. A-100.	770
Landscaping		
Landscaping	Trees, shrub areas and including SOD as per landscaping plans. LNP.1 – 2.	18,946
Sod & Seed		
St Augustine Sod		643
CONCRETE		
Concrete	As per specification Division 3 and structural & civil drawings.	
Monolithic Slab, Foundations/Masonry		589,844
Option for flatwork		16,498
1 set metal pan stair infill		3,767

Description	Notes	Total Amount
Concrete	As per specification Division 3 and structural & civil drawings.	
Bond Fee Concrete		21,528
Precast Architectural Sills		4,963
Precast Concrete Sub		
Precast Joist	8", 12", 16" 20" structural prestressed concrete joist and soffit beams as per civil plans and addendum no. 1.	127,410
MASONRY		
Masonry		
Masonry / CMU (included in Slab/Foundations)		0
METALS		
Miscellaneous Metals	Metal railings, handrails & stairs. Bollards; Interior & elevator pit ladder; Hoist Beam; 2 metal roof louvres as per specifications Division 4 and architectural plans.	
Misc Metals		139,819
6" Bollards - Embedded (included on Misc Metals proposal)		2,327
WOOD & PLASTICS		
Wood & Plastics		
Wood Rough Carpentry	Pressure treated wood as per specifications Division 6 and architectural plans.	1,854
THERMAL & MOISTURE PROT		
Division 7		
Waterproofing - Liquid	As per specifications Division 7 and architectural plans.	31,432
Insulation	As per specifications Division 7 and architectural plans.	
Insulation / Subcontract		13,960
Membrane: BUR Bitumen		
Type I Asphalt 2ply (including LWIC)	Modified Roofing – Garland; including LWIC, roof hatch and roof accessories as per specification Division 7, architectural plans, and addendum no. 1.	180,590
DOORS & WINDOWS		
Doors		
Doors / Frames / Hdwe / Installation	17 Hollow metal doors and frames including door accessories and assemblies as per specification Division 8 and architectural plans.	54,386
Metal-Framed Storefronts		
Aluminum Storefronts & Windows includes glass	Trulite 3100; clear anodized satin silver finish; Insulated laminated glass with gray tint and low E as per architectural plans and addendum no. 1.	135,266
FINISHES		
Finishes		
Painting	Interior & Exterior painting – Sherwin Williams as per specification	25,388

Description	Notes	Total Amount
Finishes		
	Division 9 and interior finish drawings. ID-211	
Drywall Subcontractor	As per as per specification Division 9 and architectural drawings. A650.	
Mtl Frmg / GWB / Insul / Dr Frms / Blocking		56,122
Plaster and Stucco Sub		
Stucco	As per as per specification Division 9 and architectural drawings.	48,084
Acoustical Ceiling		
Acoustical Ceiling	2x2 ceiling system; 9/16" grid Armstrong calla as per specification Division 9 and architectural drawings. A301-302.	7,135
Flooring	PT-1 - 8"x36" porcelain tile, D&B tile. PT-1 A - 6"x36" porcelain tile, D&B tile. PT-2 - 8"x24" porcelain tile, D&B tile. ET01 - 8"x36" wood finish. VWB-1 – Johnsonite SCHT-1 – Jolly Sealed Concrete As per specification Division 9 and interior finish drawings. ID-211 & A-500.	
Flooring (including exterior tile)		53,734
Sealed Concrete Floor		1,117
Window Sills		4,121
Specilaties		
Signage	1/8" Rowmark acrylic, color TBD with UV printed graphics and mounted with double sided VHB tape as per architectural drawings.	
Rooms Signage		2,126
Fire Extinguishers Etc	3 - 5lb type ABC multi-purpose dry chemical fire extinguisher as per specification Division 10 and life safety plan. LS201-202.	
Fire Extinguishers		469
Knox Box		
Knox Box		726
Protective Covers	Canvas Covered Fabric Awning	
Canopies		8,831
Bath Accessories	Bobrick as per architectural plans.	
Bath Accessories		6,858
CONVEYING SYSTEMS		
Elevators	Endura HMRL; 3,000 lbs; 150 fpm as per addendum no. 1.	
Elevator Contractor		102,129
MECHANICAL		
Plumbing	Includes plumbing fixtures, drains, electric water heater, 2 water	

Description	Notes	Total Amount
	cooler and sump pumps. Water piping – L copper. Storm piping – sched 40 PVC. Sanitary piping - sched 40 PVC. Condensates – sched 40 with insulation as per specification Division 22 and plumbing plans.	
Plumbing		88,237
HVAC	7 RTU – Trane. 5 EF – SP-B110. 2 Louvers – EHV550D. Ductwork system as per specification Division 23 and mechanical plans.	
HVAC		153,549
ELECTRICAL		
Electrical		
Electrical Contractor	As per electrical plans	183,157
Special Systems		
Lightning Protection Systems	As per specification Division 26 and electrical plans. E103.	20,386
Fire Alarm	As per electrical plans.	
Fire Alarm		19,134

Estimate Totals

Description	Amount	Totals	Rate	Cost Basis	Cost per Unit
Labor	218,597				30.836 /SF
Material	3,731				0.526 /SF
Subcontract	2,407,939				339.673 /SF
Equipment					
Other	30,919				4.361 /SF
	2,661,186	2,661,186			375.397 /SF
Insurance	31,946		1.330 %	T	4.506 /SF
	31,946	2,693,132			379.903 /SF
Builders Risk Insurance 01-01415	20,580		0.764 %	T	2.903 /SF
Cons Surety Bond 01-01062	26,256			B	3.704 /SF
Total		**2,739,968**			**386.510 /SF**

Exhibit A - First Amendment to Ahrens Enterprises Inc Agreement. _95 SW 5th

FIRST AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES - 95 SW 5TH AVENUE

FIRST AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS FIRST AGREEMENT is hereby made and entered into this 25 day of April, 2023, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WITNESSETH:

WHEREAS, the CRA and Contractor previously entered into an Agreement, dated February 28, 2023, for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB"), and the Contractor's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and Contractor desire to enter into this First Amendment to add a liquidate damages provision and to clarify various provisions from the ITB in the Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereafter set forth, the Contractor and the CRA agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. Article 6 Payment Procedures is added to the Agreement as follows:

Article 6. PAYMENT PROCEDURES.

Contractor shall submit invoices in accordance with Section 2 of the Invitation to Bid.

6.1 Progress Payments. The CRA shall make progress payments on account of the Contract Price on the basis of Contractor's invoices on or about the First day of each month during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the Contractor's Schedule of Values dated December 8, 2022 and in the case of Unit Price Work based on the number of units completed or, in the event there is no schedule of values, as provided in the CRA's Invitation to Bid.

6.1.1 Prior to Substantial Completion progress payments will be made in an amount equal to 90% of the work completed until 50% of the work has been completed and installed, then payment may be made in an amount equal to 95% of the work completed, but in each case, less the aggregate of payments previously made and less such amounts as CRA shall determine, or the CRA may withhold, in accordance with Section 6.1.3 of this Agreement.

6.1.2. Prior to Substantial Completion, progress payments for materials and equipment not incorporated in the Work but delivered and suitably stored and accompanied by documentation satisfactory to the CRA, as provided in the Invitation to Bid, will be made in an amount equal to 0% as established by the schedule of values.

6.1.3 The CRA is entitled to withhold amounts due Contractor for any defective or non-conforming work or for liquidated damages.

6.2 Final Payment. Upon final completion and acceptance of the Work in accordance with Section 3 of the Invitation to Bid, the CRA shall pay the remainder of the Contract Price.

3. Article 7 Liquidated Damages is added to the Agreement as follows:

ARTICLE 7. LIQUIDATED DAMAGES

The CRA and Contractor recognize that time is of the essence of this Agreement and that the CRA will suffer financial loss if the Work is not completed within the times specified in Article 5 above, plus any extensions thereof allowed in accordance with Article 5. Work shall mean the goods the Contractor shall provide or the services the Contractor shall perform in accordance with Article 2 above.

They also recognize that the actual loss suffered by the CRA if the Work is not completed on time is not readily ascertainable at the time of entering this Contract. Accordingly, instead of requiring any such proof, the CRA and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay the CRA five hundred dollars ($500.00) for each day that expires after the time specified in Article 5 for substantial completion until the Work is substantially complete. After Substantial Completion if Contractor shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by the CRA, Contractor shall pay CRA five hundred dollars ($500.00) for each day that expires after the time specified in Article 5 for completion and readiness for final payment. Contractor expressly acknowledges that such sum is not payable as a penalty but as liquidated damages representing a reasonable estimate of delay damages, inconvenience and additional overhead and costs likely to be sustained by the CRA, estimated at the time of executing the Agreement. If the CRA reasonably believes in its discretion that Substantial Completion will be delayed, it shall be entitled, but not required to withhold from any amounts otherwise due the Contractor an amount then believed by the CRA to be adequate to recover liquidated damages applicable to such delays. Partial use or occupancy of the Work shall not result in the Work deemed substantially completed, and such partial use or occupancy shall not be evidence of Substantial Completion.

4. Article 8 No Damages for Delray is added to the Agreement as follows:

Article 8. NO DAMAGES FOR DELAY.

8.1 All time in the Contract Documents is calculated on a consecutive calendar day basis.

8.2 Time is of the essence in this Contract, and any breach of same shall go to the essence hereof, and Contractor, in agreeing to complete the Project within the time herein mentioned, has taken into consideration and made allowances for all reasonable hindrances and delays incident to his work.

8.3 Contractor agrees to commence the Project when directed by the CRA and to diligently and continuously perform such work and to coordinate the work with other work being performed on the Project by other trades so that the CRA shall not be delayed by any act or omission of Contractor in completion of the Project within the time specified above.

8.4 Contractor shall not be entitled to any claim for damages on account of hindrance or delays from any cause whatsoever, but if caused by any act of God or active interference on the part of the CRA, such act, hindrance or delay may only entitle the Contractor to receive an extension of time as its sole and exclusive remedy, as set forth in Section 1 paragraph 59 of the Invitation to Bid

8.4.1 Any extension of time to complete the Project maybe allowed at the sole discretion of the CRA provided the Contractor provides the CRA with notice in writing of the cause of said act, hindrance, or delay within **twenty (20) days** after its occurrence.

8.4.2 In the event the request for extension is not made in writing within that twenty-day (20) time period, Contractor acknowledges and agrees it has forever waived any and all rights to such an extension.

8.4.3 All extensions of time shall be authorized only by a written change order executed by the CRA and Contractor; in the absence of a written and fully executed change order, Contractor shall not be entitled to any claim for additional time.

8.4.4 This "no damage for delay" provision shall encompass any damages for delay or disruption even if the Contractor completes construction of the Project in a timely fashion in accordance with this Contract.

8.4.5 Damages as referenced in this "no damage for delay" provision shall include any type of damages that are or could be awarded by any court or arbitration panel such as, by way of general example, but not limitation, tort, contract, strict liability, consequential damages, liquidated damages and/or punitive damages.

8.4.6 The Contractor recognizes and specifically acknowledges the terms and conditions of this "no damage for delay" clause upon execution of this Contract.

5. Article 9 Public Records is added to the Agreement as follows:

Article 9. PUBLIC RECORDS:

CONTRACTOR shall comply with the applicable provisions of Chapter 119, Florida Statutes. Specifically, CONTRACTOR shall:

A. Keep and maintain public records required by the CRA to perform the service.

B. Upon request from the CRA's custodian of public records, provide the CRA with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in this chapter or as otherwise provided by law.

C. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the CONTRACTOR does not transfer the records to the CRA.

D. Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of the CONTRACTOR or keep and maintain public records required by the public agency to perform the service. If the contractor transfers all public records to the CRA upon completion of the contract, the contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the CONTRACTOR keeps and maintains public records upon completion of the contract, the contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from the CRA's custodian of public records, in a format that is compatible with the information technology systems of the public agency.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT

KIM PHAN
561-276-8640
KIMP@MYDELRAYBEACH.COM
20 NORTH SWINTON AVENUE
DELRAY BEACH, FLORIDA 33444

The failure of CONTRACTOR to comply with the provisions set forth in this Article shall constitute a Default and Breach of this Agreement.

6. Article 10 Independent Contractor is added to the Agreement as follows:

ARTICLE 10. INDEPENDENT CONTRACTOR

Contractor has been procured and is being engaged to provide services to the CRA as an independent contractor, and not as an agent or employee of the CRA. Accordingly, Contractor shall not attain, nor be entitled to, any rights or benefits of the CRA, nor any rights generally afforded classified or unclassified employees. Contract further understands that Florida Workers' Compensation benefits available to employees of the CRA are not available to Contractor and agrees to provide workers' compensation insurance for any employee or agent of Contractor rendering services to the CRA under this Agreement.

7. That except as amended herein, the CRA and Contractor ratify, approve and reaffirm the terms of the Agreement and shall remain in full force and effect, except as amended herein.

8. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement and this First Amendment, the terms and provisions of this First Amendment shall control to the extend of any such conflict or ambiguity. In any other respects, the Agreement remains unchanged.

IN WITNESS WHEREOF, the parties have executed this First Amendment on the dates hereinafter written.

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

By: _____
Adam Frankel, Chair

ATTEST:

By: _____
Renée A. Jadusingh, CRA Executive Director

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY

By: _____
Kim N. Phan, Legal Advisor

AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES, a Florida Corporation

[SEAL]

By: Richard C. Ahrens

Printed Name: RICHARD C. AHRENS

Title: PRESIDENT / CEO

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me by means of ☑ physical presence or ☐ online notarization, this 17 day of APRIL, 2023, by RICHARD C. AHRENS (name of person), as PRESIDENT/CEO (type of authority) for AHRENS ENTERPRISES INC (name of party on behalf of whom instrument was executed).

Personally known ✓ OR Produced Identification
Type of Identification Produced _____

Bonnie S. Daniels
Notary Public – State of Florida

BONNIE S. DANIELS
MY COMMISSION # HH3180
EXPIRES: May 27, 2024

SECOND AMENDMENT TO THE AGREEMENT
BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY
AND AHRENS ENTERPRISES, INC. D/B/A AHRENS COMPANIES
(95 SW 5TH Avenue)

THIS SECOND AMENDMENT TO THE AGREEMENT ("Second Amendment") is made and entered into as of the 11TH day of OCTOBER, 2023, by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public agency created pursuant to Section 163, Part III, Florida Statutes, (hereinafter referred to as the "CRA"), and **AHRENS ENTERPRISES, INC. D/B/A AHRENS COMPANIES,** a Florida corporation (hereinafter referred to as "CONTRACTOR").

W I T N E S S E T H:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR entered into a First Amendment to Agreement dated April 25, 2023 to add a liquidated damages provision and clarifying certain terms of the ITB ("First Amendment"); and

WHEREAS, CRA and CONTRACTOR desire to enter into this Second Amendment in order to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the price of the compensation owed to the CONTRACTOR in an amount not to exceed $1,500.00 to increase the materials and labor needed to perform necessary structural adjustments to the foundation of the commercial building, and as further set forth in the Change Order attached as Exhibit "A" to this Second Amendment, which is incorporated herein by reference. The total sum due to the CONTRACTOR is amended to $2,741,468.00.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement and First Amendment, and the Agreement and First Amendment, shall remain in full force and effect, except as amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, the First Amendment, and this Second Amendment, this Second Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Second Amendment to the Agreement on the date first written above

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

By: _____
Adam Frankel, Chair

ATTEST:

_____
Renée A. Jadusingh, Esq.
CRA Executive Director

APPROVED AS TO FORM:

_____

CONTRACTOR:
AHRENS ENTERPRISES, INC. dba Ahrens Companies, a Florida corporation

BY: _____
Signature

RICHARD C. AHRENS
Print Name and Title

STATE OF FLORIDA)
)ss:
COUNTY OF PALM BEACH)

The foregoing instrument was acknowledged before me by means of □ physical presence or □ online notarization, this OCT. 11TH, 2023 by Richard C. Ahrens as President/CEO of AHRENS ENTERPRISES, INC., a Florida corporation, on behalf of the company. He X is personally known to me or ___ has produced _____ as identification.

Susanne Ruth Cirillo
Signature

SUSANNE CIRILLO - FL NOTARY
Name and Title

HH405157
Commission Number

SUSANNE RUTH CIRILLO
Notary Public
State of Florida
Comm# HH405157
Expires 5/31/2027

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 4R
Date: 9/11/2023

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
ADD A 16"X 6' STEP IN FOUNDATION

$1,500.00

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 9/11/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

ADDITIONAL COSTS ASSOCIATED WITH THE INCREASE OF LABOR AND MATERIALS TO ADD THE 16" X 6' STEP IN THE FOUNDATION AS DIRECTED IN THE STRUCTURAL ENGINEERS STAMPED DRAWINGS .
THESE COSTS ARE FOR THE INCREASE OF MATERIALS INCLUDING BUT NOT LIMITED TO : CONCRETE, COMPLEX REBAR, CMU BLOCKS, FORMING AND BRACING MATERIALS. tHE INCREASE IN PRICE ALSO INCLUDES LABOR TO BUILD THE COMPLEX FORM STRUCTURE, INSTALL THE ADDITIONAL STEP /LAP REBAR, PLAN COORDINATION WORK ASSOCIATED WITH THE ADDED COMPLEXITY OF EXCAVATION . STRUCTURAL DRAWING ATTACHED .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$0.00
The Contract Amount prior to this Change Order was	$2,739,968.00
The Contract will be changed by this Change Order in the amount of	$1,500.00
The new Contract Amount including this Change Order will be	$2,741,468.00

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens
(Signature)

Richard C. Ahrens, CEO/President
By

9/11/2023
Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 4 R
Date: 9/11/23
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: ADD A 16"X 6' STEP IN FOUNDATION

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 9/11/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

ADDITIONAL COSTS ASSOCIATED WITH THE INCREASE OF LABOR AND MATERIALS TO ADD THE 16" X 6' STEP IN THE FOUNDATION AS DIRECTED IN THE STRUCTURAL ENGINEERS STAMPED DRAWINGS .
THESE COSTS ARE FOR THE INCREASE OF MATERIALS INCLUDING BUT NOT LIMITED TO : CONCRETE, COMPLEX REBAR, CMU BLOCKS, FORMING AND BRACING MATERIALS. tHE INCREASE IN PRICE ALSO INCLUDES LABOR TO BUILD THE COMPLEX FORM STRUCTURE, INSTALL THE ADDITIONAL STEP /LAP REBAR, PLAN COORDINATION WORK ASSOCIATED WITH THE ADDED COMPLEXITY OF EXCAVATION . STRUCTURAL DRAWING ATTACHED .

Description	Price
ADD A 16"X 6' STEP IN FOUNDATION	$1,500.00
Subtotal:	$1,500.00
Total:	**$1,500.00**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

THIRD AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS THIRD AMENDMENT is hereby made and entered into this 29TH day of JANUARY, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WITNESSETH:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR entered into a First Amendment to Agreement dated April 25, 2023 to add a liquidated damages provision and clarifying certain terms of the 1TB ("First Amendment"); and

WHEREAS, C R A and CONTRACTOR entered into a Second Amendment dated October 11, 2023 to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building which increased the total sum due to the CONTRACTOR TO $2,741,468.00; and

WHEREAS, CRA and CONTRACTOR desire to enter into this Third Amendment in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the price of the compensation owed to the CONTRACTOR in an amount not to exceed $102,300.34 to increase the materials and labor needed to perform necessary structural adjustments to the foundation of the commercial building, and as further set forth in the Change Order attached as Exhibit "A" to this Third Amendment, which is incorporated herein by reference. The total sum due to the CONTRACTOR is amended to $2,843,768.34.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, and the Second Amendment. The Agreement, First Amendment, and Second Amendment shall remain in full force and effect, except as amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, the First Amendment, Second Amendment, and this Third Amendment, this Third Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Second Amendment to the Agreement on the date first written above.

ATTEST:

Renee A. Jadusingh, CRA Executive Director

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Adam Frankel, Chair

Approved as to Form:

Ashlyn K. Darden, CRA Legal Advisor

ATTEST:

Print Name: Susanne Ruth Cirillo

Title: Project Accounting & Admin.

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: President

(SEAL)

SUSANNE RUTH CIRILLO
Notary Public
State of Florida
Comm# HH405157
Expires 5/31/2027

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this 29th day of January, 2024, by Richard C. Ahrens, as President (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification.

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 5
Date: 12/18/2023

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SUPPLY GARLAND MODIFIED ROOFING SYSTEM

$85,987.65

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 12/21/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.
WE PROPOSE TO FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM THE FOLLOWING WORK AS CALLOUT IN THE CONTRACT SPECIFICATIONS:
1. FURNISH AND INSTALL 1/4" PER FOOT LIGHTWEIGHT INSULATING CONCRETE. (MIN R=20)
2. MECHANICALLY FASTEN ONE (1) LAYER OF GARLAND HRP TRI-BASE PREMIUM IN ACCORDANCE WITH ENGINEERING AND FLORIDA BUILDING CODE.
3. INSTALL ONE (1) LAYER OF GARLAND STRESSBASE 80 BASE SHEET, SET IN HOT ASPHALT IN ACCORDANCE WITH FLORIDA BUILDING CODE.
4. INSTALL ONE (1) LAYER OF GARLAND STRESSPLY E FR MINERAL CAP SHEET , SET IN HOT ASPHALT IN ACCORDANCE WITH FLORIDA BUILDING CODE.
5. ALL BASE FLASHINGS AND CURBS PER ATTACHED PROPOSAL .
6. FURNISH AND INSTALL GARLAND MANUFACTURED R -MER EDGE COPING CAP.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$1,500.00
The Contract Amount prior to this Change Order was	$2,741,468.00
The Contract will be changed by this Change Order in the amount of	$85,987.65
The new Contract Amount including this Change Order will be	$2,827,455.65

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

12/18/2023

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 5
Date: 12/18/23
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SUPPLY GARLAND MODIFIED ROOFING SYSTEM

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 12/21/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.
WE PROPOSE TO FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM THE FOLLOWING WORK AS CALLOUT IN THE CONTRACT SPECIFICATIONS:
1. FURNISH AND INSTALL 1/4" PER FOOT LIGHTWEIGHT INSULATING CONCRETE. (MIN R=20)
2. MECHANICALLY FASTEN ONE (1) LAYER OF GARLAND HRP TRI-BASE PREMIUM IN ACCORDANCE WITH ENGINEERING AND FLORIDA BUILDING CODE.
3. INSTALL ONE (1) LAYER OF GARLAND STRESSBASE 80 BASE SHEET, SET IN HOT ASPHALT IN ACCORDANCE WITH FLORIDA BUILDING CODE.
4. INSTALL ONE (1) LAYER OF GARLAND STRESSPLY E FR MINERAL CAP SHEET , SET IN HOT ASPHALT IN ACCORDANCE WITH FLORIDA BUILDING CODE.
5. ALL BASE FLASHINGS AND CURBS PER ATTACHED PROPOSAL .
6. FURNISH AND INSTALL GARLAND MANUFACTURED R-MER EDGE COPING CAP.

Description	Price
SUPPLY GARLAND MODIFIED ROOFING SYSTEM	$76,788.40
AHRENS OVERHEAD FEES 10%	$7,678.84
GENERAL LIABILITY 1.33%	$1,021.29
BUILDERS RISK .65%	$499.12
Subtotal:	$85,987.65
Total:	**$85,987.65**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

GRACE ROOFING & SHEET METAL ENTERPRISE

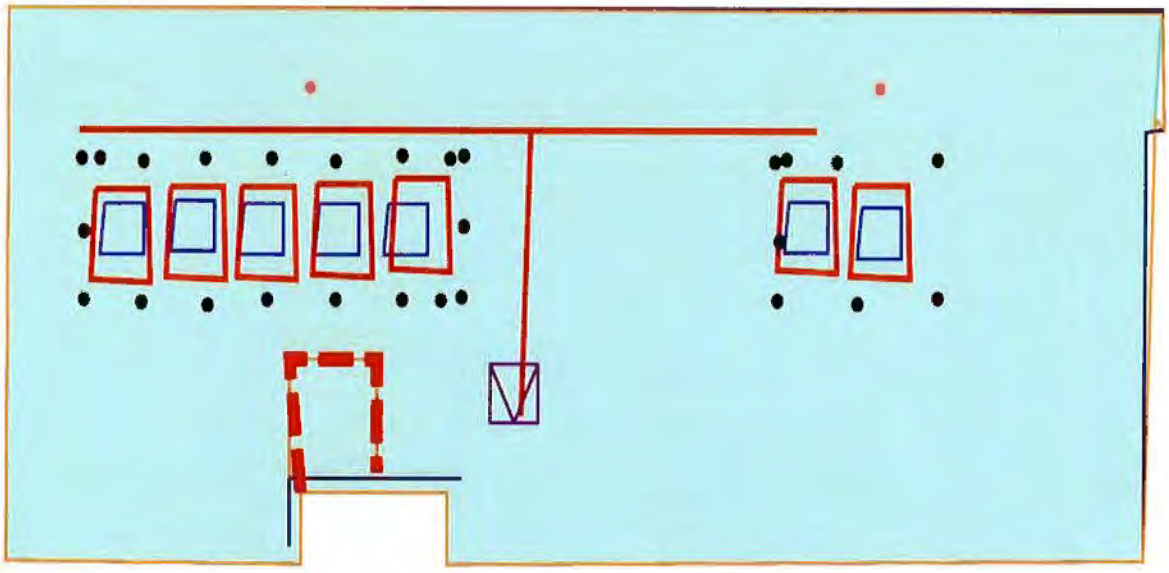
LIC #: CCC1329300

To: Bryan D. Sumner
Project Manager 609-302-1405
bsumner@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403
ahrenscompanies.com

Date: 12/15/2023

Project: CRA Development
95 SW 5th AVE, Delray Beach.

Roof Plan



GRACE ROOFING & SHEET METAL ENTERPRISE

LIC #: CCC1329300

Scope of Work

Garland roof system

General Condition Setup	4,961.92	SF
Ligtweigth Insulated Concrete	4,961.92	SF
Modified roofing system	4,961.92	SF
Supervision Fee	4,961.92	SF
30-Year Warranty Fee	4,961.92	SF
Permit Fee	4,961.92	SF
Wall Flashing up and over	17.14	LF
Wall Flashing up to 12"	362.86	LF
2" x 8" Wood nailers	330.32	LF
040 Aluminum Parapet coping	330.00	LF
Curb Flashing	115.62	LF
2" x 6" Wood nailers	27.39	LF
Walkpads	278.56	LF
Roof Drain Flashing	2.00	EA
Over Flow Roof Drain Flashing	2.00	EA
Drip Edge	28.60	LF
Engineering fees	1.00	EA
General Conditions - Equipment	1.00	EA
General Conditions - Crane	6.00	EA
Roof penetration flashing	6.00	EA
Screen wall supports flashing	27.00	EA
VTR flashing	6.00	EA
Bilco Roof hatch and fall protectian	1.00	EA
One way vents	5.00	EA

Exclusions:
1) Ladder to roof hatch
2) Any work over concrete eyebrow and canopies

Permitting
An allowance of $300 is included in the contract price to secure the permit

Payment Terms
40% Deposit, 40% at First Inspect, 20% at Completion
Interest shall accrue on any unpaid balance starting two calendar days past the due date, as specified, at 1.5% per month or at the maximum legal rate permitted by law.

Warranty
30 YEAR NDL GARLAND MANUFACTURER WARRANTY ON ROOFING SYSTEM

ROOF WORKMANSHIP WARRANTY IS FOR 5 YEARS AGAINST LEAKS FROM THE DATE OF INSTALLATION.

TOTAL ESTIMATE: $257,378.40

ESTIMATE IS VALID FOR 45 DAYS.

The material costs component of this agreement has been calculated based on current market prices for tile, lumber and other required roofing materials. However, these prices are volatile, andsudden price increases or lack of available inventory may occur during performance of this agreement. Should after execution of this agreement an increase in the costs of materials and/or alack of available materials occur, Owner hereby agrees that Contractor shall be entitled to an equitable adjustment to the agreement price and time of performance. Any claim by Contractor for an equitable adjustment in price and time shall be made pursuant to materials adjustment notice to Owner. The lack of available inventory of materials shall not be considered an event causing delayto the project schedule for any reason.

OWNER'S RIGHT TO CANCEL. Owner has the unconditional right to cancel this proposal without penalty or obligation, until midnight of the third business day (Saturday count, Sundays and most holidays do not) after signing. Cancellation must be done in writing. Grace Roofing & Sheet Metal Enterprise reserve the right to withdraw this proposal at any time prior to customer's acceptance. The customer is liable for 10% of the contract amount for liquidated damages if the customer cancels prior to the start of work.

ACCORDING TO FLORIDA'S CONSTRUCTION LIEN LAW (SECTIONS 713.001-713.37, FLORIDA STATUTES), THOSE WHO WORK ON YOUR PROPERTY OR PROVIDE MATERIALS AND SERVICES AND ARE NOT PAID IN FULL HAVE A RIGHT TO ENFORCE THEIR CLAIM FOR PAYMENT AGAINST YOUR PROPERTY.

TERMS AND CONDITIONS

•In the event of a major storm like a hurricane, tornado or hail warranty will become null and void. These are considered acts of God and the damage coverage falls to your homeowner's policy.

•Additional expenditures (if any) arising due to Building Inspectors inspections that are not part of Contractor's 'Scope of Work' (wood trim painting, gutter replacements, additional drainage provisions, elimination of ponding water, additional wood blocking, additional fastening) shall be paid by the Owner.

•The Owner waives claims for consequential damages arising out of or relating to this agreement and the work performed therein. This waiver includes but is not limited to damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, loss of management or Owners extended general conditions.

•Unless otherwise provided, Contractor disclaims any express or implied warranties, including but not limited to the implied warranty of merchantability and fitness for a particular purpose.

•This agreement shall be governed by the laws of the State of Florida. Venue of any proceeding shall be exclusively in Broward County, Florida. Should Contractor employ an attorney to institute litigation to enforce this agreement or protect its interest Contractor shall be entitled to recover from Owner all of its attorney's fees, expenses and costs including but not limited to fees incurred in any appeal.

•The Owner and Contractor waive all rights against each other for damages caused by fire or other causes of loss to the extent covered by property insurance.

•The invalidity, illegality or unenforceability of any provision of this agreement shall not affect any other provision of this agreement, which agreement shall remain in full force and effect and shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

•Contractor shall not be held liable for any existing site conditions, including but not limited to the presence of mold and spores which existed prior to or during the roofing operations contemplated by this agreement.

•THE PARTIES HEREBY EXPRESSLY WAIVE THE RIGHT TO TRIAL BY JURY IN ANY DISPUTES WHICH MAY ARISE FROM THE PERFORMANCE OF THIS AGREEMENT.

•Contractor shall not be responsible for disturbance, damage, and cleanup, loss of use or loss to interior property that customer did not remove or protect prior to commencement and during the course of roofing tear-off and re-roofing operations.

•Owner represents that he/she is legal and/or equitable owner of the property where the work will be performed.

•Certificates of Worker's Compensation and General Liability Insurance will be provided upon request.

•Contractor shall comply with fire, safety and security regulations. The Contractor will be careful not to clog gutters, headers and down spouts. Contractor shall not be responsible for these items if they are clogged, since the build-up of debris in these areas over the years could be substantial. All drains shall be checked prior to commencement of project by Owner.

•All debris, resulting from Contractor's work, shall be removed from the premises at periodic intervals during the progress of work and immediately following completion.

•If any buildings or units have been leaking and visible water damage is present prior to Contractor beginning work, then the Owner or Owner's Insurance shall be responsible for any damages caused by water intrusion during the course of the work.

•Contractor is not responsible for building movement, natural disasters, or ponding water damages. Contractor shall not be responsible for damaged caused, either during or after its scope of work is completed, by unforeseen violent weather, including, but not limited to, hurricanes, tornadoes, floods, hail, sleet and other Acts of God. Contractor shall be responsible for reasonably securing materials and equipment in the event of a storm. Contractor shall perform all roofing work in such a manner as to protect the building against leakage during the completion of the roofing project.

•Contractor shall not be responsible for unseen, hidden, and/or covered damage to the deck or any items unseen, hidden, covered or unsecured by Owner/Unit Owners before tearing off the roofing system, if applicable.

•Owner expressly understands and acknowledges that Contractor is a roofing, waterproofing and sheet metal Contractor. Contractor is not an Engineer, Architect or other design professional, and makes no representations with regard to the condition of the deck system or any other portion of the project not within the Contractor's scope of work.

•Should the Owner elect not to secure the services of Contractor to perform all of the required maintenance items, at or above the roof level, as outlined in Contractor specifications, or as recommended in future correspondence, the expressed warranties provided by Contractor shall be null and void. If Maintenance or other work on the roof is completed by others not authorized

by Contractor, any expressed warranties shall be null and void.

CONFLICT OF TERMS

To the extent the terms of this Agreement conflict with any other written, verbal, signed terms between the Owner and Contractor, including the Scope of Work, the terms contained in this Agreement shall supersede and control. The terms of this Agreement may only be modified in writing signed by both parties.

GRACE ROOFING & SHEET METAL ENTERPRISE

LIC #: CCC1329300

ACCEPTED AND AGREED: The prices, specifications and conditions contained herein this Agreement are satisfactory and hereby accepted.

PROPERTY OWNER PRINT NAME	SALES REPRESENTATIVE
SIGNATURE	SIGNATURE
CO-OWNER PRINT NAME	DATE
SIGNATURE	OFFICER – Grace Roofing & Sheet Metal Enterprise
DATE	SIGNATURE
	DATE

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 6
Date: 11/20/2023

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
COLUMN CHANGE AS DIRECTED BY DESIGN TEAM

$2,411.49

ADDITIONAL COSTS ASSOCIATED WITH THE COLUMN CHANGES AS DIRECTED BY THE DESIGN TEAM :

CHANGE (3) 8X16 STANDARD MASONRY BLOCK SECTIONS OF THE WALL WITH (2) #5 TO 12X12 CMU 24' PIERS WITH THE SAME (2) #5'S FROM THE FOOTER TO THE UNDERSIDE OF THE CIP EYEBROW PER ATTACHED PLAN . ADDITIONAL COSTS AS FOLLOWS:

1. ADDITIONAL COST OF THE 12X12 CMU VERSUS THE 8X16 STANDARD CMU.
2. ADDITIONAL COST FOR THE BLOCK TIES TO TIE IN THE 8" MASONRY WITH THE 12X12 MASONRY EVERY OTHER COURSE AT (2) SIDED OF EACH OF THE (3) PIERS.
3. ADDITIONAL CONCRETE FOR GROUTING.
4. ADDITIONAL COST OF PUMP.
5. LTI MINIMUM MARKUP.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$1,500.00
The Contract Amount prior to this Change Order was	$2,741,468.00
The Contract will be changed by this Change Order in the amount of	$2,411.49
The new Contract Amount including this Change Order will be	$2,743,879.49

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President
By

11/20/2023
Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 6
Date: 11/20/23
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: COLUMN CHANGE AS DIRECTED BY DESIGN TEAM

We are pleased to offer the following specifications and pricing to make the following changes:

ADDITIONAL COSTS ASSOCIATED WITH THE COLUMN CHANGES AS DIRECTED BY THE DESIGN TEAM :

CHANGE (3) 8X16 STANDARD MASONRY BLOCK SECTIONS OF THE WALL WITH (2) #5 TO 12X12 CMU 24' PIERS WITH THE SAME (2) #5'S FROM THE FOOTER TO THE UNDERSIDE OF THE CIP EYEBROW PER ATTACHED PLAN . ADDITIONAL COSTS AS FOLLOWS:

1. ADDITIONAL COST OF THE 12X12 CMU VERSUS THE 8X16 STANDARD CMU.
2. ADDITIONAL COST FOR THE BLOCK TIES TO TIE IN THE 8" MASONRY WITH THE 12X12 MASONRY EVERY OTHER COURSE AT (2) SIDED OF EACH OF THE (3) PIERS.
3. ADDITIONAL CONCRETE FOR GROUTING.
4. ADDITIONAL COST OF PUMP.
5. LTI MINIMUM MARKUP.

Description		Price
COLUMN CHANGE AS DIRECTED BY DESIGN TEAM		$2,153.50
AHRENS OVERHEAD FEE - 10%		$215.35
GENERAL LIABILITY - 1.33%		$28.64
BUILDERS RISK - .65%		$14.00
	Subtotal:	$2,411.49
	Total:	**$2,411.49**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

Bryan Sumner

From: Todd Everly <teverlyltishell@gmail.com>
Sent: Thursday, September 14, 2023 1:30 PM
To: Bryan Sumner; Tim Clark; Ross Person; Lti Development
Cc: Richard Ahrens; Angie Fuertes; Brian Witt
Subject: Re: Delray Column change order
Attachments: image004.png

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Official COR #1 For CRA Delray

Bryan
For the sake of time, effort and paperwork,
Please consider this as the **Official COR #1** for changing a (3) 8 x 16 standard masonry block sections of the wall with 2 #5 to 12 x 12 CMU Pier with the same 2 #5's from the footer to the underside of the CIP Eyebrow per this plan attached
Additional cost of labor
Additional cost of the 12 x 12 CMU versus the 8 x 16 standard CMU
Additional cost for block ties to tie in the 8" Masonry with the 12 x 12 Masonry every other course at 2 sided of each of the 3 piers
Additional concrete for grouting
Additional cost of the pump
LTI Min Mark Up.
Total COR # 1 $2,153.50

_____ _____
Signature of approval Date

If this meets with your approval you can just print, sign and return or send an official CO from Ahrens office.

Thank You

Todd Everly

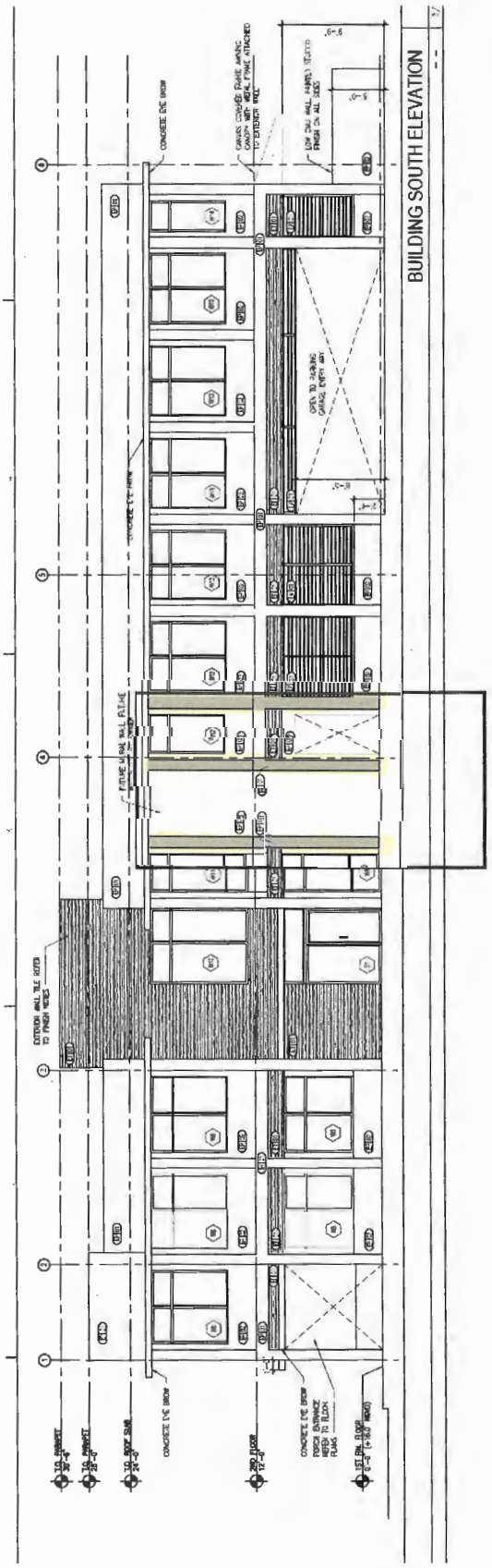
VP of Shell Construction

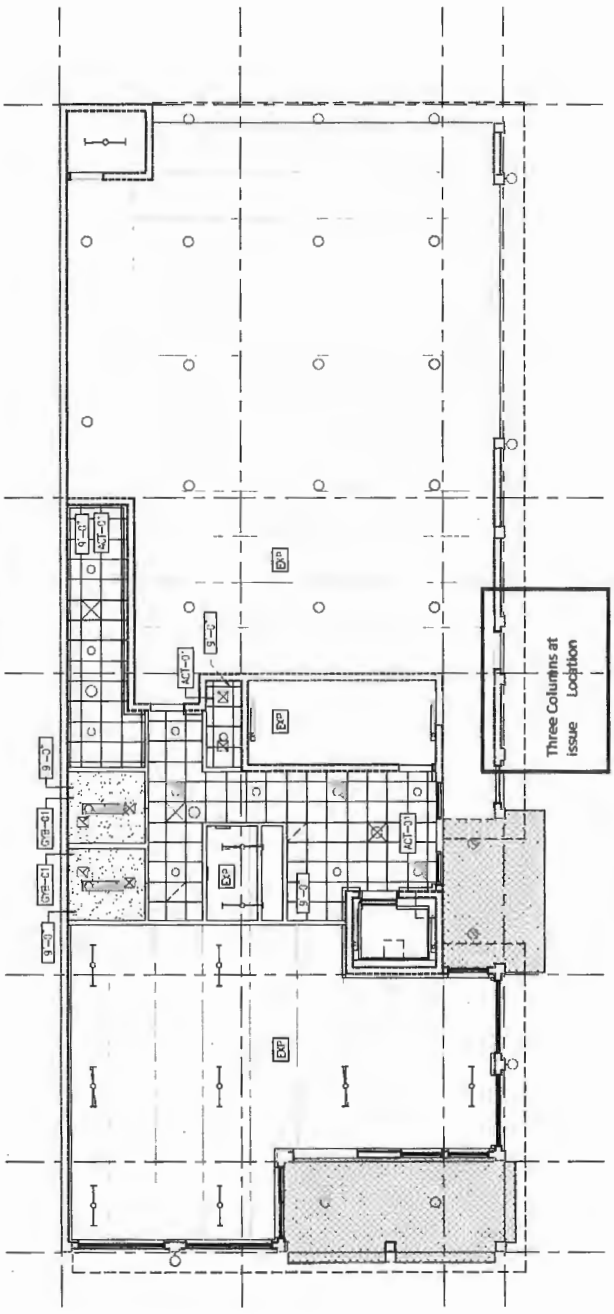
LTI Development CO Inc. (Shell Division)

3570 Consumer St Suite # 3 WPB Fl 33404

561 296 1193 off 561 296 1203 fax 561 662 6881 cell

INITIALS: Contractor _____ **Subcontractor/Supplier** _____





INITIALS: Contractor _____ **Subcontractor/Supplier** _____

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 7R
Date: 11/20/2023

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
PRICE INCREASE DUE TO PLAN REVISION #1

$7,390.68

ADDITIONAL COSTS ASSOCIATED WITH PLAN REVISION #1.

1. CONCRETE MASONRY: Redesign the precast Joist system and perform new calculations for both the 2nd floor and roof joists systems. Relocate all effected vertical rebar and relay out all affected walls.

2. MECHANICAL: Add Roof Air Intakes, and Relief Vents. Revise exhaust ductwork to accommodate the louver transition from back wall to roof mounted Ventilator. Supply and install a gravity Roof Ventilator as per plans. Supply and install all transitional ductwork to the roof ventilation system.

3. ELECTRICAL: Revise light on the second floor, adjacent to stairs as directed on E-101. Supply and install all conduit, electrical wiring to Gravity Roof Ventilator. Add the necessary connections and ground wires to the lightning protection system. Revised Fire alarm devices on the second floor, adjacent to stairs as directed on E-301.

4. INTERIOR FRAMING AND FINISHES: Modify the bathroom wall system. Add semi-rigid insulation. Supply, install, and finish 5/8 GWB over 1-5/8 free standing steel stud wall system.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$1,500.00
The Contract Amount prior to this Change Order was	$2,741,468.00
The Contract will be changed by this Change Order in the amount of	$7,390.68
The new Contract Amount including this Change Order will be	$2,748,858.68

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens

(Signature)

Richard C. Ahrens, CEO/President

By

11/20/2023

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 7R
Date: 11/20/23
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: PRICE INCREASE DUE TO PLAN REVISION #1

We are pleased to offer the following specifications and pricing to make the following changes:

ADDITIONAL COSTS ASSOCIATED WITH PLAN REVISION #1.

1. CONCRETE MASONRY: Redesign the precast Joist system and perform new calculations for both the 2nd floor and roof joists systems. Relocate all effected vertical rebar and relay out all affected walls.

2. MECHANICAL: Add Roof Air Intakes, and Relief Vents. Revise exhaust ductwork to accommodate the louver transition from back wall to roof mounted Ventilator. Supply and install a gravity Roof Ventilator as per plans. Supply and install all transitional ductwork to the roof ventilation system.

3. ELECTRICAL: Revise light on the second floor, adjacent to stairs as directed on E-101. Supply and install all conduit, electrical wiring to Gravity Roof Ventilator. Add the necessary connections and ground wires to the lightning protection system. Revised Fire alarm devices on the second floor, adjacent to stairs as directed on E-301.

4. INTERIOR FRAMING AND FINISHES: Modify the bathroom wall system. Add semi-rigid insulation. Supply, install, and finish 5/8 GWB over 1-5/8 free standing steel stud wall system.

Description		Price
ELECTRICAL - LIGHTNING PROTECTION SYSTEM		$1,500.00
CONCRETE & MASONRY		$5,100.00
AHRENS COMPANIES OVERHEAD 10%		$660.00
GENERAL LIABILITY - 1.33%		$87.78
BUILDERS RISK - .65%		$42.90
	Subtotal:	$7,390.68
	Total:	**$7,390.68**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

- LTI-

Construction & Development Co. Inc.
(SHELL DIVISION)
3570 Consumer Street Suite # 3 West Palm Beach Fl 33404
Phone (561) 296-1193 Toll Free (800) 746-6020
Facsimile (561) 296-1203, Website: lticonstruction.co
CBC058600

November 28, 2023
Ahrens
1461 Kinetic Road Lake Park, FL 33403

Revised Change Order Request #2 CRA Delray

Lowering and redoing 50 LF of footers and moving dowels to adjust the building by 2"
See field ticket attachment #1

Man hours for removing forms, redoing rebar, adding Z bars, extending dowels and moving dowels for 2" to shift the building

4 men, 24 hours= 96 @ $55	$5,280.00
Additional supervision, 8 hours @ $68.50	$548.00
Machine and operator, 8 hours	$880.00
Rebar and accessories	$224.15
LTI minimum mark up	$1,039.82
Total Change Order Request 2	**$7,971.97**
Good Customer Credit	**($2,871.97)**
Total Revised COR #2	**$5,100.00**

Please sign and return or issue an official change order #2 from your office

Sincerely,

Todd Everly
LTI Construction & Development Co. Inc

Senior Contracts/ Project Manager

_____ _____

Agent for Ahrens **Date**

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 8
Date: 11/20/2023

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
ADDITIONAL STUCCO WORK

$6,510.52

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 01/29/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

STUCCO WORK NOT INCLUDED IN THE DESIGN DOCUMENTS. STUCCO WORK TO INCLUDE MATERIALS, LABOR, EQUIPMENT NEEDED TO APPLY STUCCO IN THE FOLLOWING AREAS :

TRASH ROOM EXTERIOR 1044 SQ FT $5,814.00

MAN HOURS AND ADDITIONAL STAGING INCLUDED IN PRICING .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$1,500.00
The Contract Amount prior to this Change Order was	$2,741,468.00
The Contract will be changed by this Change Order in the amount of	$6,510.52
The new Contract Amount including this Change Order will be	$2,747,978.52

The Contract Time will be increased by 2 DAYS.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens

(Signature)

Richard C. Ahrens, CEO/President

By

11/20/2023

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 8
Date: 1/5/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: ADDITIONAL STUCCO WORK

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 01/29/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

STUCCO WORK NOT INCLUDED IN THE DESIGN DOCUMENTS. STUCCO WORK TO INCLUDE MATERIALS, LABOR, EQUIPMENT NEEDED TO APPLY STUCCO IN THE FOLLOWING AREAS :

TRASH ROOM EXTERIOR 1044 SQ FT $5,814.00

MAN HOURS AND ADDITIONAL STAGING INCLUDED IN PRICING .

Description		Price
TRASH ROOM EXTERIOR 1044 SQ FT		$5,814.00
AHRENS COMPANIES OVERHEAD 10%		$581.40
GENERAL LIABILITY - 1.33%		$77.33
BUILDERS RISK - .65%		$37.79
	Subtotal:	$6,510.52
	Total:	**$6,510.52**

Please note that AHRENS COMPANIES will require an extra 2 DAYS.

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

FOURTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS FOURTH AMENDMENT is hereby made and entered into this 29TH day of FEBRUARY, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

W I T N E S S E T H:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR entered into a First Amendment to Agreement dated April 25, 2023 to add a liquidated damages provision and clarifying certain terms of the 1TB ("First Amendment"); and

WHEREAS, C R A and CONTRACTOR entered into a Second Amendment dated October 11, 2023 to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building which increased the total sum due to the CONTRACTOR TO $2,741,468.00; and

WHEREAS, CRA and CONTRACTOR entered into a Third Amendment dated January 29, 2024 in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room; and

WHEREAS, CRA and CONTRACTOR desire to enter into this Fourth Amendment in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the price of the compensation owed to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building, attached as Exhibit "A" to this Fourth Amendment, which is incorporated herein by reference. The total sum due to the CONTRACTOR is amended to $2,847,082.70.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, the Second Amendment, and the Third Amendment. The Agreement, First Amendment, Second Amendment and Third Amendment shall remain in full force and effect, except as amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, the First Amendment, Second Amendment, Third Amendment, and this Fourth Amendment, this Fourth Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Fourth Amendment to the Agreement on the date first written above.

ATTEST:

Renee A. Jadusingh, CRA Executive Director

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Adam Frankel, Chair

Approved as to Form:

Ashlyn K. Darden, CRA Legal Advisor

ATTEST:

Print Name: SUSANNE CIRILLO

Title: PROJECT ACCOUNTING

SUSANNE RUTH CIRIL
Notary Public
State of Florida
Comm# HH40515
Expires 5/31/202

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

(SEAL)

Print Name: RICHARD C. AHRENS

Title: PRESIDENT

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this 29th day of FEBRUARY, 2024, by RICHARD C. AHRENS, as PRESIDENT (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification.

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 9R
Date: 2/8/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
OPENINGS AT FRONT OF BUILDING CHANGED TO 16"X12"

$3,314.36

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 02/13/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

MODIFY (3) OPENINGS BETWEEN 12X12 COLUMNS AT FRONT OF BUILDING WITH NEW DESIGN OF 16"X12" BEAMS AND THE ADDITION OF 25LF OF SILLS NEEDED FOR OPENING.

THESE CHANGES CAN BE FOUND ON DRAWING S20 REV 3 DATED 1/29/2024, ATTACHED

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$103,111.96
The Contract Amount prior to this Change Order was	$2,843,079.96
The Contract will be changed by this Change Order in the amount of	$3,314.36
The new Contract Amount including this Change Order will be	$2,846,394.32

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens

(Signature)

Richard C. Ahrens, CEO/President

By

2/8/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 9R
Date: 2/8/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: OPENINGS AT FRONT OF BUILDING CHANGED TO 16"X12"

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 02/13/2023 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

MODIFY (3) OPENINGS BETWEEN 12X12 COLUMNS AT FRONT OF BUILDING WITH NEW DESIGN OF 16"X12" BEAMS AND THE ADDITION OF 25LF OF SILLS NEEDED FOR OPENING.

THESE CHANGES CAN BE FOUND ON DRAWING S20 REV 3 DATED 1/29/2024, ATTACHED

Description		Price
OPENINGS AT FRONT OF BUILDING CHANGED TO 16"X12"		$3,250.00
GENERAL LIABILITY - 1.33%		$43.23
BUILDERS RISK - .65%		$21.13
	Subtotal:	$3,314.36
	Total:	**$3,314.36**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

- LTI-

Construction & Development Co. Inc.

(SHELL DIVISION)

3570 Consumer **S**treet **S**uite **3 W**est **P**alm **B**each **F**□**33404**

Phone **561 296-1193 F**ax **561 296-1203, W**ebsite lticonstruction **.**co

CBC058600

Change **O**rder **R**equest **5 F**or **CRA D**elray

Per Cody's and erry 's **C**onversation

anuary **29, 2024**

Ahrens **C**ompanies

Modify 3 openings between 12x12 columns at front of building

~~Demo as is and add 4" CMU~~		~~1,500.00~~
Add 25 LF of 12" CIP beams		2,375.00
~~Demo and deposit into receptical by others after beams have cured to Create new openings~~		~~2,000.00~~
25 LF of CIP or precast sills		875.00
Total **C**hange **O**rder **R**equest	**$3,250.00**	~~6,750.00~~

Please sign and return or issue an official change order **5** from your office keeping in mind that this must be completed during like phases or minimums and short charges will apply **.**

Sincerely,

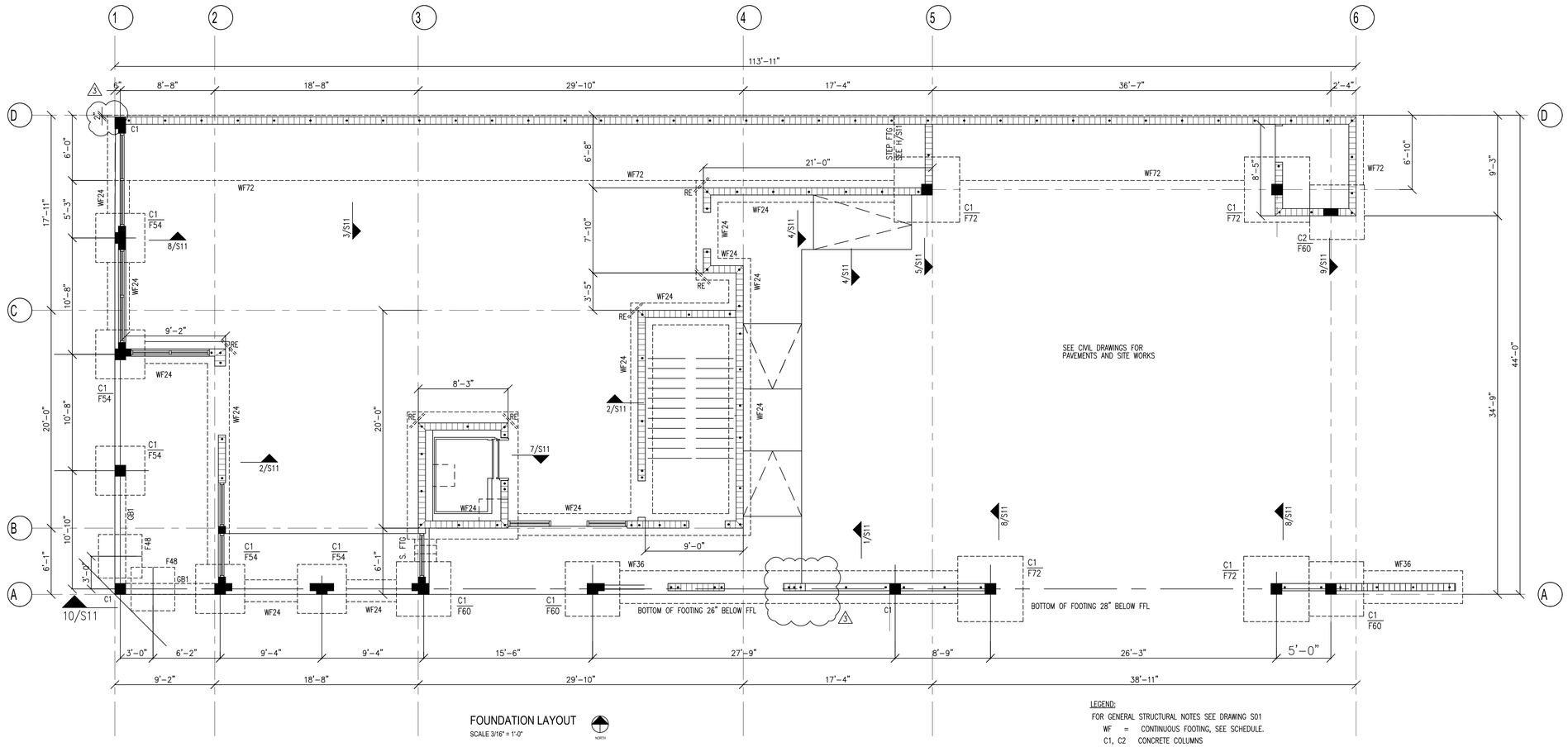
Todd Everly

LTI Construction & Development Co. Inc

Senior Contracts/ Project Manager

Agent for **A**hrens **C**ompanies

Date



FOUNDATION LAYOUT

SCALE 3/16" = 1'-0"

LEGEND:

FOR GENERAL STRUCTURAL NOTES SEE DRAWING S01

- WF = CONTINUOUS FOOTING, SEE SCHEDULE.
- C1, C2 CONCRETE COLUMNS
- GB1 12"x20" DEEP GRADE BEAM, 6#8T, 3#8B, #3 STIRRUPS AT 6" O.C.
- S. FTG STEPPED FOOTING
- TOF TOP OF FOOTING
- BOF BOTTOM OF FOOTING
- CJ CONTROL JOINT IN SLAB
- RE = RE-ENTRANT BARS. 2#4 x 6'-0" LONG AT MIDDLE OF SLAB SECTION.
- REINFORCED MASONRY WALL
- C1: 8" WIDE REINFORCED CONCRETE WALL AT C1 WITH 2#5 VERTICAL BARS, 1" COVER. COORDINATE LENGTH WITH ARCH DWGS
- 8"x8" REINFORCED CONCRETE WALL AT GRID LINE 2B WITH 4#5 VERTICAL BARS, 1" COVER

FOUNDATION PLAN NOTES:

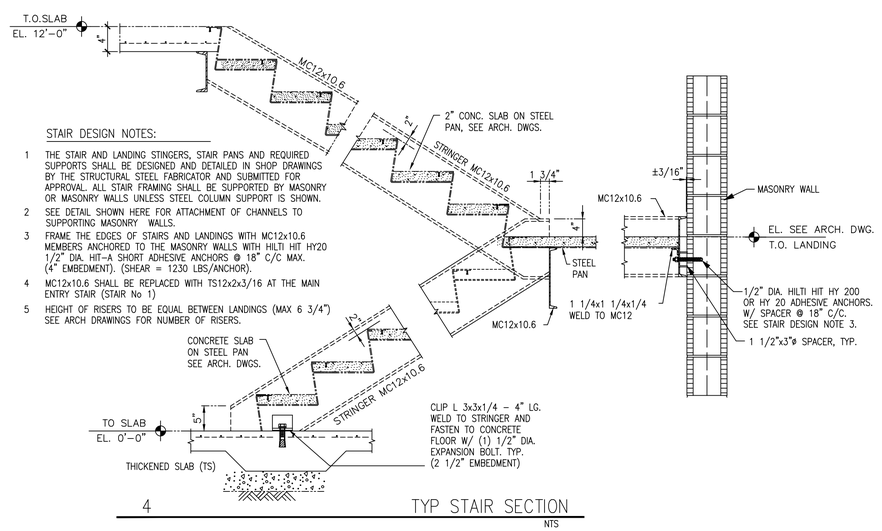
1. ALLOWABLE NET SOIL BEARING CAPACITY = 2500 PSF. THE CONTRACTOR IS TO CONFIRM THIS BEFORE EXCAVATING.
2. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER.
3. SEE S11 FOR TYPICAL FOUNDATION DETAILS. TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS OTHERWISE NOTED.
4. F**... ETC INDICATES CONCRETE FOOTING. e.g. F36 INDICATES A FOOTING 36" SQUARE
5. VERIFY BEARING CAPACITY AT BOTTOM OF FOOTING EXCAVATIONS PRIOR TO PLACING CONCRETE. INSPECTOR TO VERIFY AND REPORT PLACEMENT OF REINFORCING STEEL PRIOR TO PLACEMENT OF CONCRETE.
6. REINFORCING AT CORNERS IN FOOTINGS PER DETAIL C/S11 TO MAINTAIN CONTINUOUS REINFORCING.
7. COORDINATE WITH OTHER CONTRACT DOCUMENTS FOR INSTALLATION OF ALL REQUIRED SLEEVES, INSERTS, ETC. UNDER THE CONCRETE FOOTINGS.
9. FOR SLAB ON GRADE DETAILS, SEE A/S11.
10. PROVIDE CONTROL JOINTS IN THE SLAB ON GRADE TO FORM NEAR SQUARE PANELS AS SHOWN.
11. CENTERLINE OF FOOTING TO MATCH CENTERLINE OF COLUMN UNO
12. MAINTAIN SLAB DEPTH AT SLOPED SLABS.
13. GROUT SOLID MASONRY BELOW FIRST FLOOR F.F.L.

CONT. WALL FOOTING SCHEDULE		
MARK	FOOTING SIZE WxD	REINFORCING
WF24	2'-0"x12" CONT.	3-#5 L.W. CONT. + #5 @ 15" S.W. BOT.
WF36	6'-0"x12" CONT.	4-#5 L.W. CONT. + #5 @ 12" S.W. BOT.
WF72	6'-0"x16" CONT.	7-#5 L.W. CONT. + #5 @ 12" S.W. T&B

SPREAD FOOTING SCHEDULE			2500 PSF
MARK	FOOTING SIZE	REINFORCING	REMARKS
F36	NOT USED		
F48	4'-0"x4'-0"x12"	5#5 BOT. E.W.	
F54	4'-6"x4'-6"x12"	5#5 BOT. E.W.	
F60	5'-0"x5'-0"x13"	7#4 BOT. E.W.	
F72	6'-0"x6'-0"x14"	7#5 BOT. E.W.	

TOP OF FOOTINGS SHALL BE 12" BELOW GRADE OR FFL

CONCRETE COLUMN SCHEDULE				
MARK	SIZE	MAIN (VERTICAL) REINFORCING	#3 TIE SPACING	REMARKS
C1	12" x 12"	4#8	12"	
C2	8" x 16"	6#6	8"	

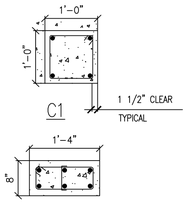


STAIR DESIGN NOTES:

1. THE STAIR AND LANDING STINGERS, STAIR PANS AND REQUIRED SUPPORTS SHALL BE DESIGNED AND DETAILED IN SHOP DRAWINGS BY THE STRUCTURAL STEEL FABRICATOR AND SUBMITTED FOR APPROVAL. ALL STAIR FRAMING SHALL BE SUPPORTED BY MASONRY OR MASONRY WALLS UNLESS STEEL COLUMN SUPPORT IS SHOWN.
2. SEE DETAIL SHOWN HERE FOR ATTACHMENT OF CHANNELS TO SUPPORTING MASONRY WALLS.
3. FRAME THE EDGES OF STAIRS AND LANDINGS WITH MC12x10.6 MEMBERS ANCHORED TO THE MASONRY WALLS WITH HILTI HIT HY20 1/2" DIA. HIT-A SHORT ADHESIVE ANCHORS @ 18" C/C MAX. (4" EMBEDMENT). (SHEAR = 1230 LBS/ANCHOR).
4. MC12x10.6 SHALL BE REPLACED WITH TS12x2x3/16 AT THE MAIN ENTRY STAIR (STAIR No 1)
5. HEIGHT OF RISERS TO BE EQUAL BETWEEN LANDINGS (MAX 6 3/4") SEE ARCH DRAWINGS FOR NUMBER OF RISERS.

4 TYP STAIR SECTION

NTS



Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 26263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22
2	REVISION	9/20/23
3	REVISION	1/29/24

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FOUNDATION LAYOUT

Sheet # :
S10

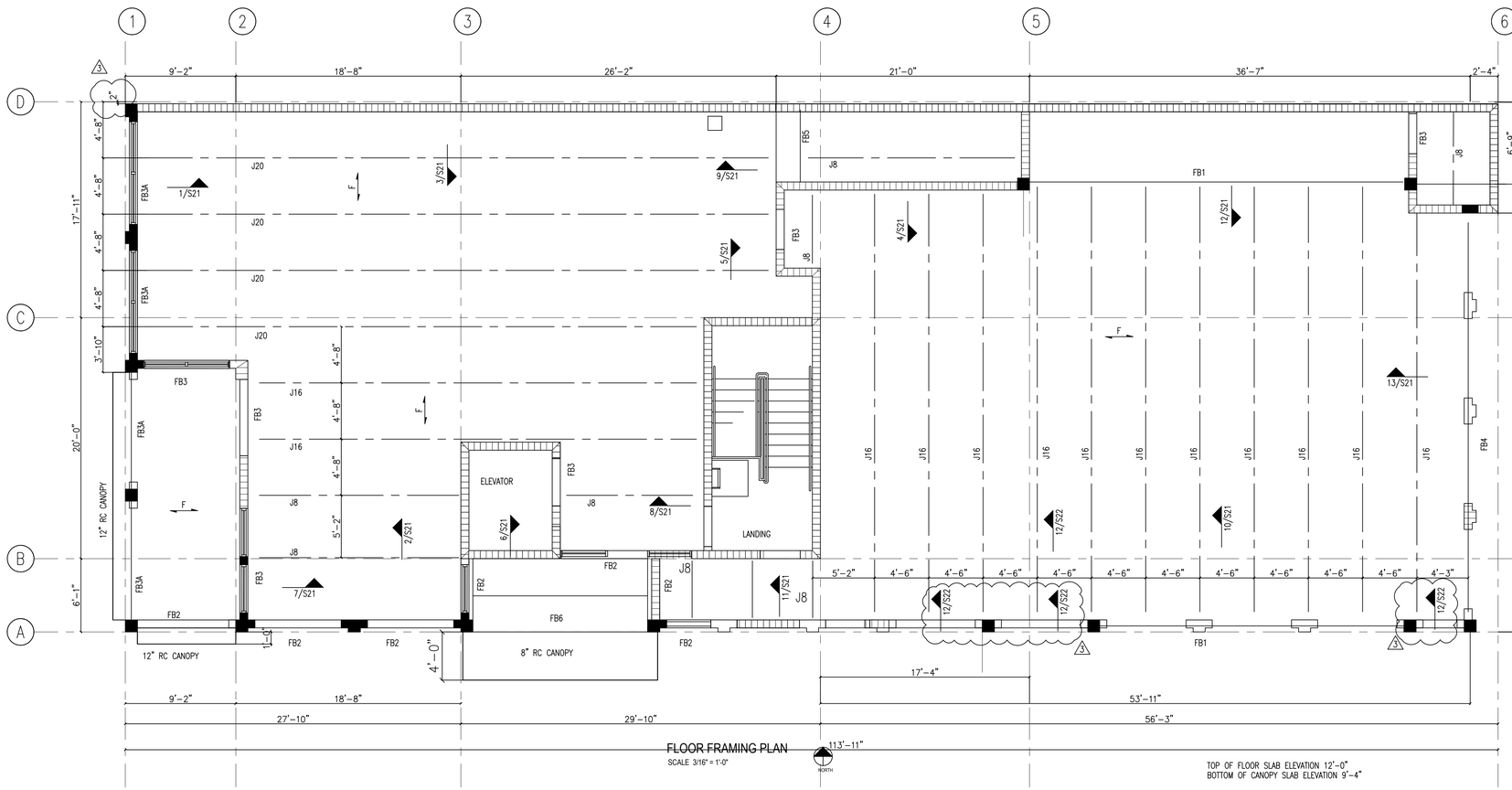
FLOOR PLAN NOTES:

1. CONCRETE JOISTS BY JOIST MANUFACTURER PER PCI SPECS. PRE-ENGINEERED PRESTRESSED JOISTS TO BEAR ON BEARING PADS AND SPACED PER THE P.C. JOIST MANUFACTURER.
2. FLOOR JOIST SHALL BE 16" DEEP PRESTRESSED, PRECAST CONCRETE JOISTS (J16) AT 4'-6" O.C. MAXIMUM UNO.
3. FLOOR SLAB: 4" N.W CAST IN PLACE REINFORCED CONCRETE SLAB WITH #3 AT 12" O.C. TOP AND BOTTOM, EACH WAY, 3/4" COVER.
4. WALLS SHOWN ARE BEARING WALLS AND NON-LOADBEARING WALLS UNDER THE LEVEL SHOWN. FOR WALLS ABOVE THIS LEVEL, SEE STRUCTURAL LEVEL ABOVE AND THE ARCHITECTURAL DRAWINGS.
5. SEE GENERAL STRUCTURAL NOTES ON S01.

LEGEND

F	INDICATES DIRECTION OF FLOOR SPAN
J8	8" PRECAST JOIST
J16	12" PRECAST JOIST
J20	20" PRECAST JOIST

TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.



FLOOR FRAMING PLAN
SCALE 3/16" = 1'-0"

TOP OF FLOOR SLAB ELEVATION 12'-0"
BOTTOM OF CANOPY SLAB ELEVATION 9'-4"

CAST IN PLACE CONCRETE BEAM SCHEDULE

MARK	SIZE BxD	TOP REBAR	BOTTOM REBAR	#3 STIRRUP SPACING, INCH	COMMENT	ULTIMATE MOMENT Kip-FT	ULTIMATE SHEAR Kips	SHEAR FRICTION BARS
FB1	16"x32"	4#6			SOFFIT BEAM	435	68	3#6
FB1A	NOT USED							
FB2	8"x32"	2#6	2#6	14				
FB3	8"x32"	2#6	2#6	14				
FB3A	16"x32"	3#6			SOFFIT BEAM	71	24	3#5
FB4	16"x32"	4#6			SOFFIT BEAM	424	50	3#6
FB5	24"x30 1/2"	3#6			SOFFIT BEAM	85	17	3#5
FB6	36"x8"	4#8	8#8		SLAB/BEAM			

PROVIDE 16" EMBEDMENT INTO EACH SOFFIT BEAM TO #5 SHEAR FRICTION BARS
PROVIDE 20" EMBEDMENT INTO EACH SOFFIT BEAM TO #6 SHEAR FRICTION BARS

Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

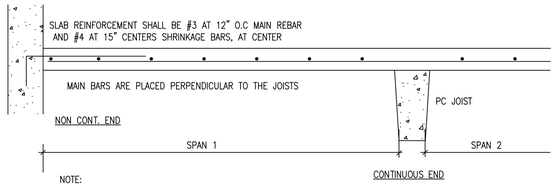
1	RFI #2	10/6/22
2	RFI #7	7/12/23
3	REVISION	1/29/24

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

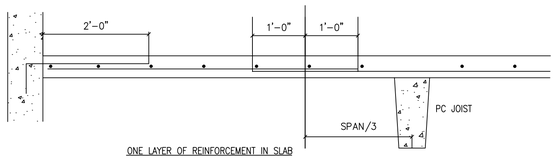
Sheet Title :
FLOOR FRAMING PLAN

Sheet # :
S20



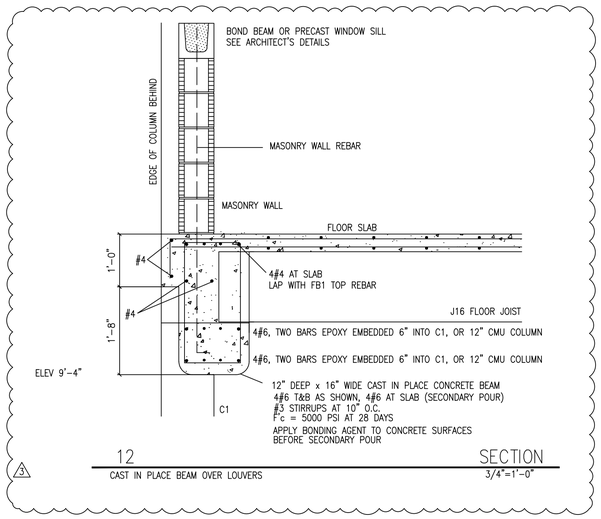
NOTE:
ELEVATED, ROOF SLAB SHALL BE 3" THICK, NORMAL WEIGHT CONCRETE WITH 6" AVERAGE CELLULAR CONCRETE TOPPING. MECH/ELEC CONSULTANT TO CONFIRM TOPPING THICKNESS. SEE PLANS FOR SLAB SUPPORT SPACING.

11 ELEVATED ROOF SLAB REINFORCEMENT DETAIL, TYP
NTS

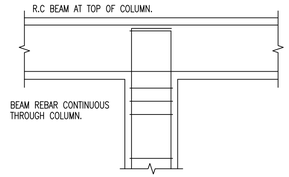


NOTE:
1. LENGTH OF LAP FOR #4 BARS SHALL BE 24 INCHES.
2. TRANSVERSE BARS MAY BE LAPPED AT ANY LOCATION

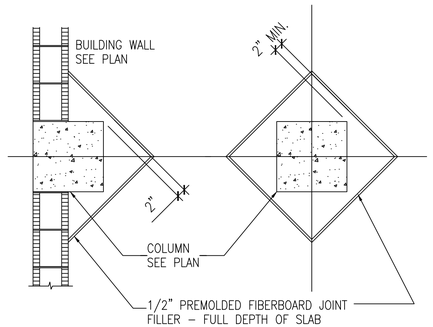
A LAPS FOR SLAB REINFORCEMENT
NTS



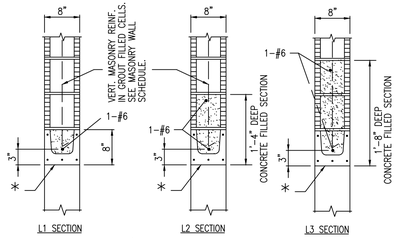
12 SECTION
CAST IN PLACE BEAM OVER LOUVERS — 3/4"=1'-0"



5A RC COLUMN DETAILS
TOP OF COLUMN AT CONTINUOUS BEAM — NTS



9 COLUMN ISOLATION JOINT DETAILS
NTS



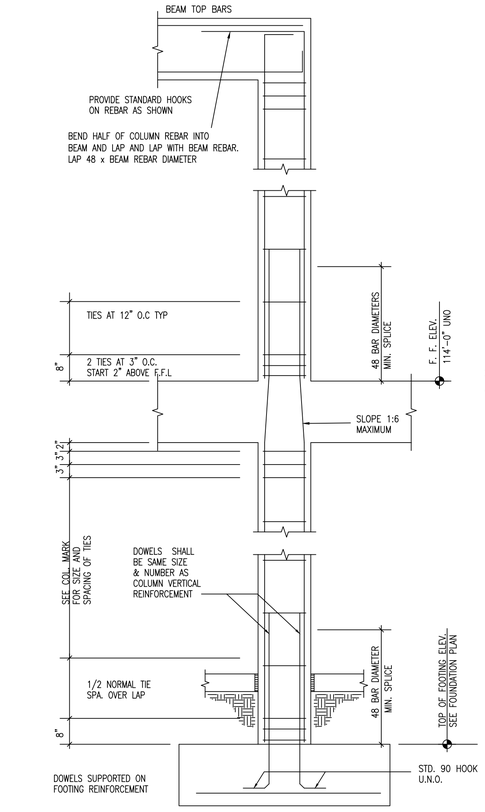
* PRECAST CONCRETE LINTEL AS MANUFACTURED BY CAST-CRETE, OR APPROVED EQUAL. WITH 8" BEARING EACH END. ENDS TO HAVE 5 1/2" LONG x 4" WIDE NOTCH TO ACCOMODATE VERTICAL REINFORCING AND GROUTING. – TYPICAL.

NOTES:
1. GROUT SOLID ALL MASONRY UNITS AS SHOWN.
2. ALL REINFORCING BARS HAVE STANDARD HOOKED AT THEIR ENDS
3. CMU SHALL BE 8" NORMAL WEIGHT LAID IN RUNNING BOND.
4. SHORE LINTEL UNTIL CONCRETE CURES (7 DAY MIN)

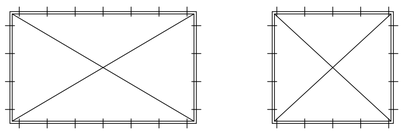
LINTEL SCHEDULE				
PLAN MARK	MAXIMUM OPENING WIDTH FT	CASTCRETE LINTEL DETAILS	ACTUAL LOADS PLF	ALLOWABLE LOADS PLF
L1	4'–0"	8F8, 1T	1100 –636	1969 G –1407 U
L2	8'–0"	8F16, 1T, 1B	1100 –636	1625 G –1133 U
L3	12'–0"	8F24, 1T, 1B	1100 –636	1838 G –962 U

1838 G: 1836 PLF VERTICAL GRAVITY LOAD
–962 U: 962 PLF UPLIFT LOAD

10 CONCRETE MASONRY LINTEL DETAILS
NTS

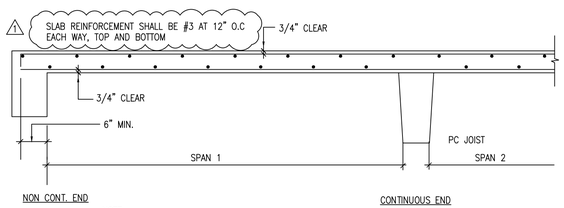


5 TYPICAL RC COLUMN DETAILS
NTS



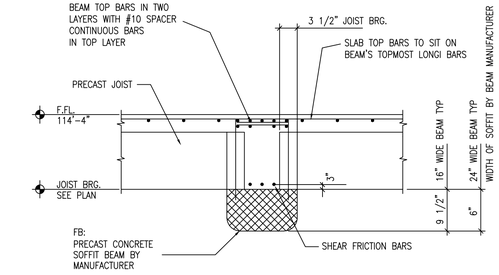
BUCKS TO BE FASTENED HORIZONTALLY AND VERTICALLY TO CONCRETE BEAMS AND COLUMNS OR CONCRETE FILLED MASONRY.
G.C. TO COORDINATE OPENING DIMENSIONS AND BUCK FASTENING DETAIL WITH PRODUCT APPROVALS.

6 MINIMUM WINDOW/ DOOR BUCK FASTENERS TO CMU OR RC MEMBERS
NTS

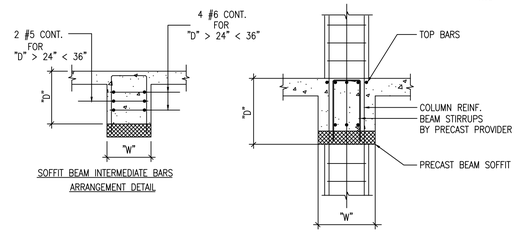


NOTE:
SEE PLANS FOR SLAB DEPTH AND SLAB SUPPORT SPACING.

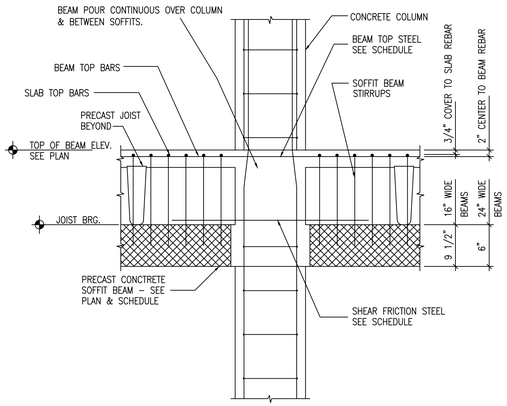
7 FLOOR SLAB REINFORCEMENT LAYOUT
NTS



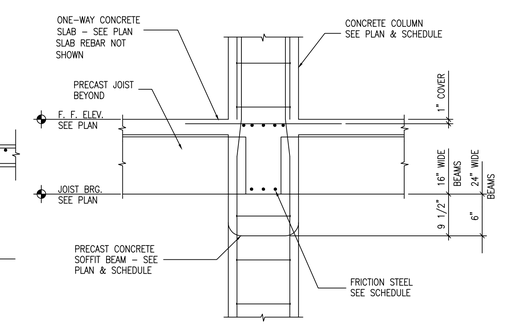
1 TYPICAL SOFFIT BEAM SECTION
NTS



2 SOFFIT BEAM DETAILS
NTS



3 SOFFIT BEAM TO COLUMN DETAIL
NTS



4 SOFFIT BEAM TO COLUMN DETAIL
NTS

Song + Associates
Architecture● Planning ● Interior Design
1545 Centrepark Drive North
West Palm Beach, Florida 33401
Telephone: 561-655-2423
Fax: 561-655-1482
AA - 0003165 IB - 0001095

Seal :
ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA
DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22
3	REVISION	9/29/24

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR SECTIONS AND DETAILS

Sheet # :
S22

FIFTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS FIFTH AMENDMENT is hereby made and entered into this 20 day of June, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WITNESSETH:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR entered into a First Amendment to Agreement dated April 25, 2023 to add a liquidated damages provision and clarifying certain terms of the 1TB ("First Amendment"); and

WHEREAS, CRA and CONTRACTOR entered into a Second Amendment dated October 11, 2023 to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building which increased the total sum due to the CONTRACTOR TO $2,741,468.00; and

WHEREAS, CRA and CONTRACTOR entered into a Third Amendment dated January 29, 2024 in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room; and

WHEREAS, CRA and CONTRACTOR entered into a Fourth Amendment dated February 29, 2024 in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building; and

WHEREAS, CRA and CONTRACTOR desire to enter into this Fifth Amendment to modify the Termination Date and in order to increase the compensation to the CONTRACTOR in an amount not to exceed $17,170.62 for materials and labor to perform column adjustments, materials and labor to add a second floor mop sink and wall bumper, materials and labor to remove a tree, storage cost for glass doors and window frames and storage cost for HVAC system; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the compensation to the CONTRACTOR in an amount not to exceed $17,170.62 for materials and labor to perform column adjustments, materials and labor to add a second floor mop sink and wall bumper, materials and labor to remove a tree, storage cost for glass doors and window frames and storage cost for HVAC system and as further set forth in the Change Order attached as Exhibit "A" to this Fifth Amendment, which is incorporated herein by reference. The total sum due to

the CONTRACTOR is amended to $2,864,253.32.

3. That the CRA and the Contractor agree to amend the Agreement to extend the Contract Term and the completion date to November 21, 2024. The Substantial Completion date shall be thirty (30) days prior to the completion date.

4. All indemnification and insurance provisions of the Agreement remain in full force and effect, including for the storage of materials provided for in his Fifth Amendment. The CRA shall have no liability, or responsibility for loss of the materials and the storage of materials provided for in this Agreement.

5. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment and the Agreement. The First Amendment, Second Amendment, Third Amendment, Fourth Amendment, and this Fifth Amendment shall remain in full force and effect, except as amended herein.

6. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, the First Amendment, Second Amendment, Third Amendment, Fourth Amendment, and this Fifth Amendment, this Fifth Amendment shall control to the extent of any such conflict or ambiguity.

7. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Second Amendment to the Agreement on the date first written above

ATTEST:

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Renée A. Jadusingh, Executive Director

Approved as to Form:

Ashlyn K. Darden, CRA Legal Advisor

ATTEST:

Print Name: Judy Ahrens

Title: Vice President

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: President / CEO

(SEAL)

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this 12 day of June, 2024, by Richard C. Ahrens, as President / CEO (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification

Bonnie S. Daniels

BONNIE DANIELS
MY COMMISSION # HH521550
EXPIRES: May 27, 2028

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 10
Date: 3/7/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
COLUMN CHANGES

$10,916.03

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 03/08/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

COLUMN CHANGES AS SHOWN ON DRAWINGS S10 AND S20 ATTACHED.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$107,114.70
The Contract Amount prior to this Change Order was	$2,847,082.70
The Contract will be changed by this Change Order in the amount of	$10,916.03
The new Contract Amount including this Change Order will be	$2,857,998.73

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

3/7/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 10
Date: 3/7/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: COLUMN CHANGES

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 03/08/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

COLUMN CHANGES AS SHOWN ON DRAWINGS S10 AND S20 ATTACHED.

Description		Price
COLUMN CHANGE		$9,748.20
AHRENS OVERHEAD FEES 10%		$974.82
GENERAL LIABILITY 1.33%		$129.65
BUILDERS RISK .65%		$63.36
	Subtotal:	$10,916.03
	Total:	**$10,916.03**

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

- LTI-

Construction & Development Co. Inc.
(SHELL DIVISION)
3570 Consumer Street Suite # 3 West Palm Beach Fl 33404
Phone (561) 296-1193 Fax (561) 296-1203, Website: lticonstruction.co
CBC058600

Change Order Request #8 Revised For CRA Delray
Per changes and additions 2/28/24

March 7, 2024
Ahrens Companies

Per the meeting that Cody and Brian had on site 2/28/24 and additional emails and phone calls between Jerry and Cody. There is a change to a column that has already been built.

Demo existing column that is being changed to a C-1 plus existing column that is attached next to it by saw cutting and chipping.	1,800
Bobcat to assist with cleanup to the dumpster provided by Ahrens.	660
New added C-1 column for 24LF @ 140 per LF.	3,360
Rebuild 8”x12” connected column for 10LF @ 92 per LF.	920
Concrete pump minimum	800
Short load minimum	500
Superintendent 12 hrs	822
Total:	8,862
LTI 10% markup per Ahrens contract.	886.20
Total Change Order Request	**$9,748.20**

Please sign and return or issue an official change order #8 from your office.

Sincerely,

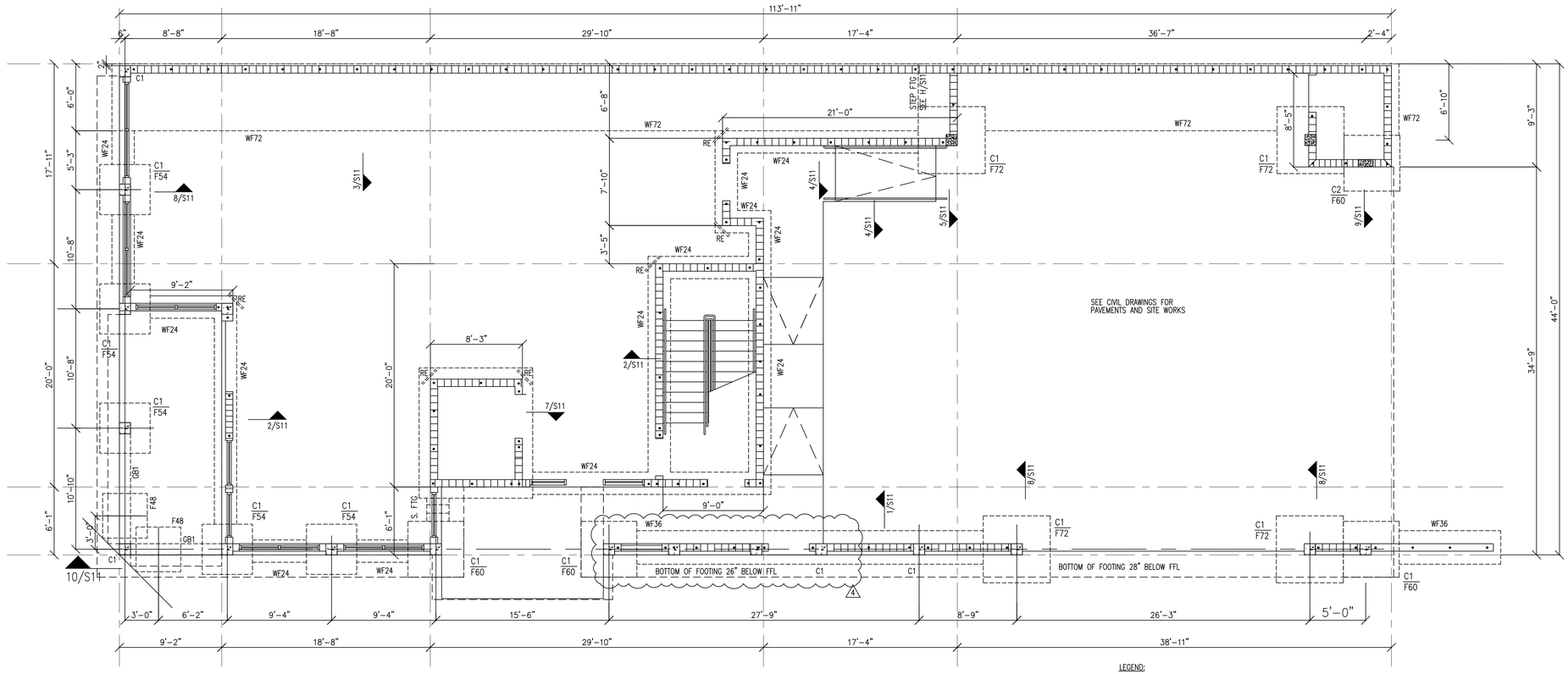
Cody Person

LTI Construction & Development Co. Inc

VP Field Operations

_____ _____

Agent for Ahrens Companies **Date**



FOUNDATION LAYOUT

SCALE 3/16" = 1'-0"

LEGEND:

FOR GENERAL STRUCTURAL NOTES SEE DRAWING S01

- WF = CONTINUOUS FOOTING, SEE SCHEDULE.
- C1, C2 CONCRETE COLUMNS
- GB1 12"x20" DEEP GRADE BEAM, 6#8T, 3#8B, #3 STIRRUPS AT 6" O.C.
- S. FTG STEPPED FOOTING
- TOF TOP OF FOOTING
- BOF BOTTOM OF FOOTING
- CJ CONTROL JOINT IN SLAB
- RE = RE-ENTRANT BARS. 2#4 x 6'-0" LONG AT MIDDLE OF SLAB SECTION.
- REINFORCED MASONRY WALL
- C1: 8" WIDE REINFORCED CONCRETE WALL AT C1 WITH 2#5 VERTICAL BARS, 1" COVER. COORDINATE LENGTH WITH ARCH DWGS
- 8"x8" REINFORCED CONCRETE WALL AT GRID LINE 2B WITH 4#5 VERTICAL BARS, 1" COVER

FOUNDATION PLAN NOTES:

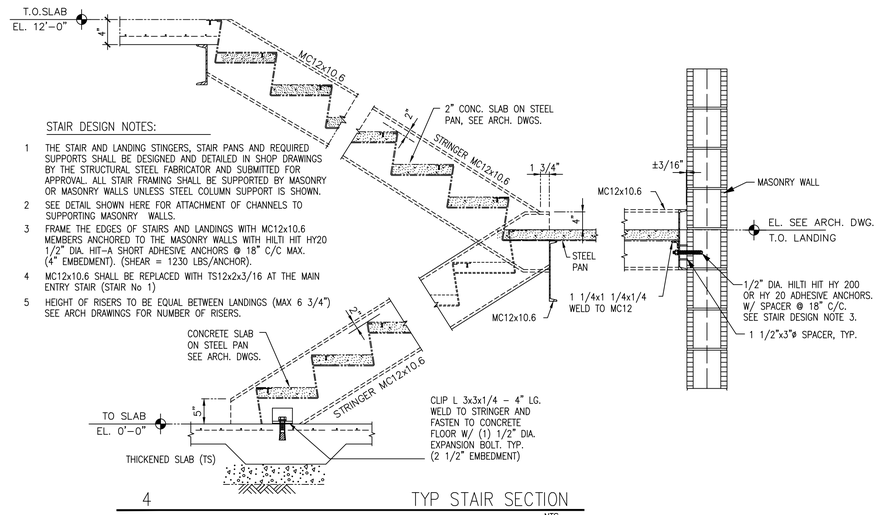
1. ALLOWABLE NET SOIL BEARING CAPACITY = 2500 PSF. THE CONTRACTOR IS TO CONFIRM THIS BEFORE EXCAVATING.
2. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER. A GEOTECHNICAL REPORT SHALL BE PROVIDED BY THE OWNER.
3. SEE S11 FOR TYPICAL FOUNDATION DETAILS. TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS OTHERWISE NOTED.
4. F**... ETC INDICATES CONCRETE FOOTING. e.g. F36 INDICATES A FOOTING 36" SQUARE
5. VERIFY BEARING CAPACITY AT BOTTOM OF FOOTING EXCAVATIONS PRIOR TO PLACING CONCRETE. INSPECTOR TO VERIFY AND REPORT PLACEMENT OF REINFORCING STEEL PRIOR TO PLACEMENT OF CONCRETE.
6. REINFORCING AT CORNERS IN FOOTINGS PER DETAIL C/S11 TO MAINTAIN CONTINUOUS REINFORCING.
7. COORDINATE WITH OTHER CONTRACT DOCUMENTS FOR INSTALLATION OF ALL REQUIRED SLEEVES, INSERTS, ETC. UNDER THE CONCRETE FOOTINGS.
9. FOR SLAB ON GRADE DETAILS, SEE A/S11.
10. PROVIDE CONTROL JOINTS IN THE SLAB ON GRADE TO FORM NEAR SQUARE PANELS AS SHOWN.
11. CENTERLINE OF FOOTING TO MATCH CENTERLINE OF COLUMN UNO
12. MAINTAIN SLAB DEPTH AT SLOPED SLABS.
13. GROUT SOLID MASONRY BELOW FIRST FLOOR F.F.L.

CONT. WALL FOOTING SCHEDULE		
MARK	FOOTING SIZE WxD	REINFORCING
WF24	2'-0"x12" CONT.	3-#5 L.W. CONT. + #5 @ 15" S.W. BOT.
WF36	6'-0"x12" CONT.	4-#5 L.W. CONT. + #5 @ 12" S.W. BOT.
WF72	6'-0"x16" CONT.	7-#5 L.W. CONT. + #5 @ 12" S.W. T&B

SPREAD FOOTING SCHEDULE			2500 PSF
MARK	FOOTING SIZE	REINFORCING	REMARKS
F36	NOT USED		
F48	4'-0"x4'-0"x12"	5#5 BOT. E.W.	
F54	4'-6"x4'-6"x12"	5#5 BOT. E.W.	
F60	5'-0"x5'-0"x13"	7#4 BOT. E.W.	
F72	6'-0"x6'-0"x14"	7#5 BOT. E.W.	

TOP OF FOOTINGS SHALL BE 12" BELOW GRADE OR FFL

CONCRETE COLUMN SCHEDULE				
MARK	SIZE	MAIN (VERTICAL) REINFORCING	#3 TIE SPACING	REMARKS
C1	12" x 12"	4#8	12"	
C2	8" x 16"	6#6	8"	

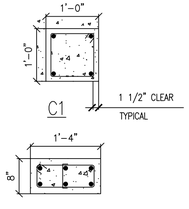


STAIR DESIGN NOTES:

1. THE STAIR AND LANDING STINGERS, STAIR PANS AND REQUIRED SUPPORTS SHALL BE DESIGNED AND DETAILED IN SHOP DRAWINGS BY THE STRUCTURAL STEEL FABRICATOR AND SUBMITTED FOR APPROVAL. ALL STAIR FRAMING SHALL BE SUPPORTED BY MASONRY OR MASONRY WALLS UNLESS STEEL COLUMN SUPPORT IS SHOWN.
2. SEE DETAIL SHOWN HERE FOR ATTACHMENT OF CHANNELS TO SUPPORTING MASONRY WALLS.
3. FRAME THE EDGES OF STAIRS AND LANDINGS WITH MC12x10.6 MEMBERS ANCHORED TO THE MASONRY WALLS WITH HILTI HIT HY20 1/2" DIA. HIT-A SHORT ADHESIVE ANCHORS @ 18" C/C MAX. (4" EMBEDMENT). (SHEAR = 1230 LBS/ANCHOR).
4. MC12x10.6 SHALL BE REPLACED WITH TS12x2x3/16 AT THE MAIN ENTRY STAIR (STAIR No 1)
5. HEIGHT OF RISERS TO BE EQUAL BETWEEN LANDINGS (MAX 6 3/4") SEE ARCH DRAWINGS FOR NUMBER OF RISERS.

4 TYP STAIR SECTION

NTS



Song + Associates

Architecture● Planning ● Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22
2	REVISION	9/20/23
3	REVISION	1/29/24
4	REVISION	2/28/24

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FOUNDATION LAYOUT

Sheet # :
S10

FLOOR PLAN NOTES:

1. CONCRETE JOISTS BY JOIST MANUFACTURER PER PCI SPECS. PRE-ENGINEERED PRESTRESSED JOISTS TO BEAR ON BEARING PADS AND SPACED PER THE P.C. JOIST MANUFACTURER.
2. FLOOR JOIST SHALL BE 16" DEEP PRESTRESSED, PRECAST CONCRETE JOISTS (J16) AT 4'-6" O.C. MAXIMUM UNO.
3. FLOOR SLAB: 4" N.W CAST IN PLACE REINFORCED CONCRETE SLAB WITH #3 AT 12" O.C. TOP AND BOTTOM, EACH WAY, 3/4" COVER.
4. WALLS SHOWN ARE BEARING WALLS AND NON-LOADBEARING WALLS UNDER THE LEVEL SHOWN. FOR WALLS ABOVE THIS LEVEL, SEE STRUCTURAL LEVEL ABOVE AND THE ARCHITECTURAL DRAWINGS.
5. SEE GENERAL STRUCTURAL NOTES ON S01.

LEGEND

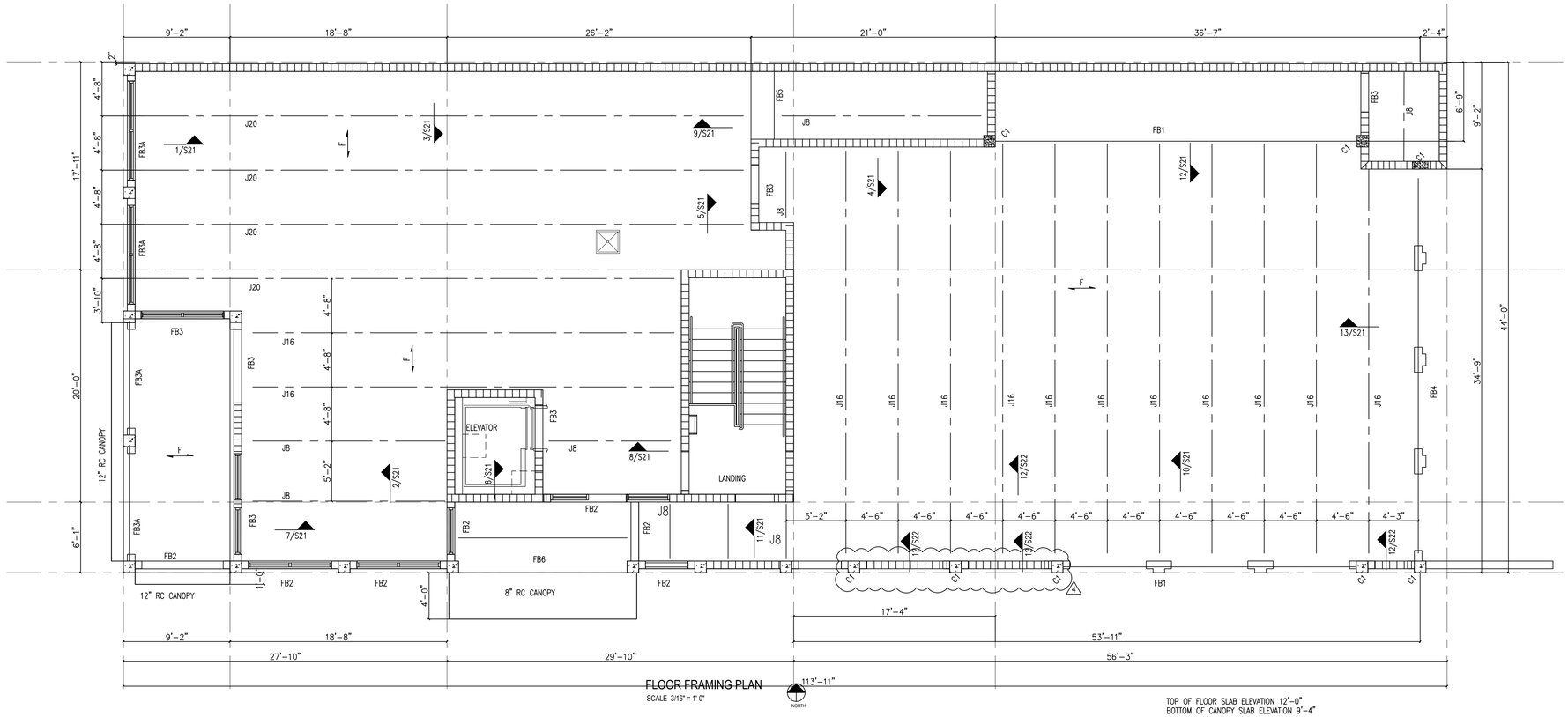
F — INDICATES DIRECTION OF FLOOR SPAN

J8 8" PRECAST JOIST

J16 12" PRECAST JOIST

J20 20" PRECAST JOIST

TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.



FLOOR FRAMING PLAN
SCALE 3/16" = 1'-0"

NORTH

TOP OF FLOOR SLAB ELEVATION 12'-0"
BOTTOM OF CANOPY SLAB ELEVATION 9'-4"

CAST IN PLACE CONCRETE BEAM SCHEDULE

MARK	SIZE BxD	TOP REBAR	BOTTOM REBAR	#3 STIRRUP SPACING, INCH	COMMENT	ULTIMATE MOMENT Kip-FT	ULTIMATE SHEAR Kips	SHEAR FRICTION BARS
FB1	16"x32"	4#6			SOFFIT BEAM	435	68	3#6
FB1A	NOT USED							
FB2	8"x32"	2#6	2#6	14				
FB3	8"x32"	2#6	2#6	14				
FB3A	16"x32"	3#6			SOFFIT BEAM	71	24	3#5
FB4	16"x32"	4#6			SOFFIT BEAM	424	50	3#6
FB5	24"x30 1/2"	3#6			SOFFIT BEAM	85	17	3#5
FB6	36"x8"	4#8	8#8		SLAB/BEAM			

PROVIDE 16" EMBEDMENT INTO EACH SOFFIT BEAM TO #5 SHEAR FRICTION BARS
PROVIDE 20" EMBEDMENT INTO EACH SOFFIT BEAM TO #6 SHEAR FRICTION BARS

Song + Associates

Architecture● Planning ●Interior Design

1545 Centrepark Drive North
West Palm Beach, Florida 33401

Telephone: 561-655-2423
Fax: 561-655-1482

AA - 0003165 IB - 0001095

Seal :

ANDREW J MORGAN LICENSE No. 57171 STATE OF FLORIDA PROFESSIONAL ENGINEER

Name : Andrew Morgan
License # : PE #57171

Consultants :

andrew morgan services
STRUCTURAL ENGINEERING
513 US Hwy 1, Suite 109, Nth Palm Beach FL 33408
tel: 561 881 8999 amorganservices@gmail.com
Certificate of Authorization # 28263

COPYRIGHT © 2021 SONG & ASSOCIATES, INC. ALL RIGHTS RESERVED. These drawings and specifications are instruments of service and shall remain the property of Song & Associates, Inc. whether the project for which they were prepared is executed or not. They are not to be used in any manner on other projects or extensions to this project except by agreement in writing with the appropriate compensation to Song & Associates, Inc. Reproduction of drawings or specifications by anyone other than Florida Power & Light Company without the written consent of Song & Associates, Inc. is prohibited.

DELRAY BEACH CRA DEVELOPMENT

CRA DEVELOPMENT
NEW BUILDING

95 SW 5TH AVE
DELRAY BEACH, FL 33483

Key Plan:

1	RFI #2	10/6/22
2	RFI #7	7/12/23
3	REVISION	1/29/24
4	REVISION	2/28/24

Date : 01-05-2022
S+A Project No : 18069
Owner Project No :
Drawn By :
Checked By :

Phase :
100% CONSTRUCTION DOCUMENTS

Sheet Title :
FLOOR FRAMING PLAN

Sheet # :
S20

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 11
Date: 4/15/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SECOND FLOOR MOP SINK DRAIN

$2,879.85

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 04/22/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

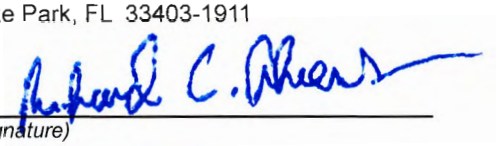
SECOND FLOOR MOP SINK DRAIN WITH STAINLESS STEEL WALL BUMPER ADDITION .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$107,114.70
The Contract Amount prior to this Change Order was	$2,847,082.70
The Contract will be changed by this Change Order in the amount of	$2,879.85
The new Contract Amount including this Change Order will be	$2,849,962.55

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911



(Signature)

Richard C. Ahrens, CEO/President

By

4/15/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 11
Date: 4/15/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SECOND FLOOR MOP SINK

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 04/22/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER I RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

SECOND FLOOR MOP SINK DRAIN WITH STAINLESS STEEL WALL BUMPER ADDITION .

Description		Price
SECOND FLOOR MOP SINK DRAIN		$2,571.75
AHRENS OVERHEAD FEES - 10%		$257.18
GENERAL LIABILITY 1.33%		$34.20
BUILDERS RISK .65%		$16.72
	Subtotal:	$2,879.85
	Total:	**$2,879.85**

The schedule will be NA.

If you have any questions, please contact me at (561)863-9004.

Submitted by: SUSIE CIRILLO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

REQUEST FOR CHANGE ORDER PROPOSAL

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O J-623-1

PROPOSAL SUBMITTED TO:	PHONE:	DATE:
AHRENS COMPANIES	561-361-6700	2/20/2024
STREET:	JOB NAME:	
1461 KINETIC ROAD	CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:	JOB:	
LAKE PARK, FL 33403	REV-2	
ARCHITECT: / DATE OF PLANS:		JOB PHONE:

We here by submit specifications and estimates for:

INCLUSION:

1.	20'	3"	PVC SCH 40 PIPE	$	70.00
2.	20'	2"	PVC SCH 40 PIPE	$	46.00
3.	1	4"X3"	PVC COMBO	$	50.00
4.	2	3"	OVC 1/8 BEND	$	11.46
5.	1	3"	PVC P-TAP	$	26.73
6.	1	3"	PVC SAN TEE	$	12.99
7.	1	3"	PVC TEST TEE	$	17.32
8.	1	3"	PVC RECESS TAP PLUG	$	6.99
9.	1	3"X2"	PVC BUSHING	$	3.87
10.	6	2"	PVC 1/4 BEND	$	30.78
11.	1	2"	PVC SAN TEE	$	4.59
12.	2	2"	PVC 1/8 BEND	$	10.16
13.	2	2"	PVC SCH 40 COUPLING	$	5.00
14.	1	3"	PVC TEST CAP	$	2.50
15.	1	QT	CAN OF GLUE	$	16.60
16.	1	QT	CAN OF CLEANER	$	15.11
17.	1	METAL	SAWALL BLADE	$	7.95
18.	20'	1/2"	CPVC PIPE	$	40.00
19.	2	1/2"	CPVC BALL VALVE	$	51.62
20.	2	1/2"	RESTER	$	51.10

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

CONTINUE TO NEXT PAGE

$0.00

Payment to be made as follows:

Authorized Signature: _____ Date: _____

REQUEST FOR CHANGE ORDER PROPOSAL

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O J-623-1

PROPOSAL SUBMITTED TO:		PHONE:	DATE:
AHRENS COMPANIES		561-361-6700	2/20/2024
STREET:		JOB NAME:	
1461 KINETIC ROAD		CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:		JOB:	
LAKE PARK, FL 33403		REV-2	
ARCHITECT:	DATE OF PLANS:		JOB PHONE:

We here by submit specifications and estimates for:

INCLUSION:

21.	1	1X1/2	CPVC TEE	$	5.75
22.	1	3/4"X1/2"	TEE	$	5.05
23.	2	1/2"	WING ELL	$	20.44
24.	8	1/2"	CPVC 90º	$	16.00
25.	4	1/2"	CPVC 45º	$	8.20
26.	2	1/2"	CPVC ST 90º	$	4.50
27.	8	1"	CPVC 90º	$	31.00
28.	2	1"	CPVC 45º	$	7.26
29.	2	1"	CPVC COUPLING	$	6.00
30.	1	1"	MALE ADAPTER	$	5.91
31.	20'	1"	CPVC PIPE	$	60.00
32.	21'	1/2"X1"	THICK FIBERGLASS INSUALTION	$	63.00
33.	1	24"X24"	GALVANIZED HEATER PAN	$	157.44
34.	3	3"	GALVANIZED TEAR DROP HANGER	$	15.75
35.	10	2"	GALVANIZED TEAR DROP HANGER	$	41.10
36.	6	1/2"	COPPER TEAR DROP	$	16.62
37.	6	1"	COPPER TEAR DROP	$	23.70
38.	78'	3/8"	ALL THREADED ROD	$	195.00
39.	25	3/8"	BEAM CLAMPS	$	25.00
40.	10	18"	CADDY BRACKETS	$	350.00

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

CONTINUE TO NEXT PAGE

$0.00

Payment to be made as follows:

Authorized

REQUEST FOR CHANGE ORDER PROPOSAL

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O J-623-1

PROPOSAL SUBMITTED TO:	PHONE:	DATE:
AHRENS COMPANIES	561-361-6700	2/20/2024
STREET:	JOB NAME:	
1461 KINETIC ROAD	CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:	JOB:	
LAKE PARK, FL 33403	REV-2	
ARCHITECT: / DATE OF PLANS:		JOB PHONE:

We here by submit specifications and estimates for:

INCLUSION:

41.	10	1/2"	FULL STRAPS	$	15.70
42.	6	1"	FULL STRAPS	$	12.00
43.	3	2"	GALVANIZED TWO HOLE STRAPS	$	9.00
44.	1	2"	FIRE COLLAR	$	25.00
45.	1	3"	FIRE COLLAR	$	35.00
46.	5		FIRE CAULK	$	50.00
47.	2		COREDRILL 1"	$	~~150.00~~
48.	1		COREDRILL 1-1/4" NA	$	~~75.00~~
49.	1		COREDRILL 3"	$	~~150.00~~
50.	1		COREDRILL 4"	$	~~150.00~~
51.	6	1-1/2"X6"	STUD GUARD	$	148.00
52.	2	3"X6"	STUD GUARD	$	7.00
53.	1		~~MOP SINK~~	$	~~271.53~~
54.	1		~~FAUCET~~	$	~~110.93~~
55.	2	1/2"X3"	~~BRASS NIPPLE~~	$	~~8.18~~
				$	~~2,755.83~~

$1840.19

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

CONTINUE TO NEXT PAGE

$0.00

Payment to be made as follows:

Authorized
Signature: _____ Date:

REQUEST FOR CHANGE ORDER PROPOSAL

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O J-623-1

PROPOSAL SUBMITTED TO:		PHONE:	DATE:
AHRENS COMPANIES		561-361-6700	2/20/2024
STREET:		JOB NAME:	
1461 KINETIC ROAD		CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:		JOB:	
LAKE PARK, FL 33403		REV-2	
ARCHITECT:	DATE OF PLANS:		JOB PHONE:

We here by submit specifications and estimates for:

INCLUSION:

MATERIAL TOTAL		$ ~~2,755.83~~ 1,840.12
LABOR:		
1. JOURNEYMAN	~~$75.00~~ $35 X 8 HOURS	$ ~~600.00~~ 280
2. JOURNEYMAN	~~$75.00 X 8 HOURS~~	$ ~~600.00~~
		$ ~~1,200.00~~
OVERHEAD 10%		$ ~~395.58~~ 184.02
PROFIT 5%		$ ~~217.57~~ 92.01
		$ ~~4,568.98~~ $2396.32
ADD ALTERNATE:		
1. 1	STAINLESS STEEL WALL BUMPER RFI#36	$ 175.53
		$2,571.75

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

FOUR THOUSAND FIVE HUNDRED SIXTY-EIGHT 98/100 $4,568.98

Payment to be made as follows:

Authorized Signature: _____ Date: _____

A-250 ENLARGED RESTROOM FLOOR PLAN.pdf A-202 SECOND FLOOR PLAN.pdf

RFI #036 - Stainless Steel Splash @ Mop Sink - RESPONSE 24_0226-.pdf

All Replies

Response from HENRIQUE CERTAD Song + Associates, Inc *on Monday, Mar 11, 2024 at 03:34 PM EDT*

As discussed, provide a stainless steel splash panel in lieu of the porcelain tile previously noted. Revised S&S sheets A-202 and A-250 will be provided shortly.

Attachments
A-250 ENLARGED RESTROOM FLOOR PLAN.pdf, A-202 SECOND FLOOR PLAN.pdf

Response from Lisa Panico AHRENS ENTERPRISES, INC. *on Friday, Mar 1, 2024 at 11:05 AM EST*

Please provide sewer and water drawings for the mop sink. Please include locations for mop sink as well.

Response from HENRIQUE CERTAD Song + Associates, Inc *on Monday, Feb 26, 2024 at 10:39 AM EST*

Yes, a stainless steel splash panel is recommended for the Mop Sink.

Attachments
RFI #036 - Stainless Steel Splash @ Mop Sink - RESPONSE 24_0226-.pdf

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Change Order: 12

Project:

22-000054 95 SW 5th AVENUE COMMERCIAL BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Date: 5/14/24

To Contractor:

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:

Remove 1 Silver Buttonwood Tree and Stump Grind	$831.44

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK . ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES , THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF CHANGE ORDER IS RECEIVED AFTER THIS DATE , NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

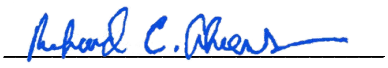
The original Contract Amount was	$ 2,739,968.00
Net change by previously authorized Change Orders	$ 120,910.58
The Contract Amount prior to this Change Order was	$ 2,860,878.58
The Contract will be changed by this Change Order in the amount of	$ 831.44
The new Contract Amount including this Change Order will be	$ 2,861,710.03

The Contract Time will be unchanged.

The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911



(*Signature*)
Richard C. Ahrens, CEO/President
By:

Date 5/22/22024

OWNER

(Signature)

By:

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

CHANGE REQUEST

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 12
Date: 5/13/2024
Job: 22-000054 95 SW 5th Avenue Commercial

Description: REMOVE 1 SILVER BUTTONWOOD TREE AND STUMP GRIND

We are pleased to offer the following specifications and pricing to make the following changes:
RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE REQUIRED CHANGE ORDERS AND SCHEDULE THE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW. IF CHANGE ORDER 12 RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITIONAL GENERAL CONDITIONS.

Description:

REMOVE 1 SILVER BUTTONWOOD TREE AND STUMP GRIND=	$	742.50
AHRENS OVERHEAD FEES - 10%	$	74.25
GENERAL LIABILITY 1.33%	$	9.87
BUILDERS RISK .65%	$	4.82
Total	$	831.44

The schedule will be NA.
If you have any questions, please contact me at (561) 839-2825.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

ABL

A Better Landscape Company

PROPOSAL CHANGE ORDER

No: 01

TO: Ahrens

Date: May 03, 2024

PROJECT: 95 SW 5th Ave

DESCRIPTION: Remove one Silver buttonwood tree including stump grinding

Item #	Description	Qty	Unit Price	Net Amount
1	Tree removal including dump fee	1	400.00	400.00
1	Dump	1	75.00	75.00
1	Stump grinder rental	1	200.00	200.00

Unit Cost:	$675.00
10% OHP:	$67.50
TOTAL:	$742.50

APPROVAL:

By: _____

Tim Kellogg

Date: 5/2/2024

By: Richard C. Ahrens

Date: 5/10/24

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 13 R1
Date: 5/22/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
STORAGE OF WINDOW FRAMES AND GLASS

$1,518.30

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

STORAGE OF WINDOWS AND FRAMES FROM JUNE 2024 TO SEPTEMBER 2024
CRA TO PAY 50% OF STORAGE COST.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$121,742.03
The Contract Amount prior to this Change Order was	$2,861,710.03
The Contract will be changed by this Change Order in the amount of	$1,518.30
The new Contract Amount including this Change Order will be	$2,863,228.33

The Contract Time will be increased by 0 days.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens

(Signature)

Richard C. Ahrens, CEO/President

By

5/22/2024 Revised 5/23/24

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 13
Date: 5/22/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: STORAGE OF WINDOW FRAMES AND GLASS

Reason: Owner Request

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

STORAGE OF WINDOWS AND FRAMES FROM JUNE 2024 TO SEPTEMBER 2024
CRA TO PAY 50% OF STORAGE COST.

Description		Price
STORAGE FOR WINDOW FRAMES FROM MILLER GLASS $225/mo x 4 months = $900.00 ./. 2 =		$450.00
RENT WAREHOUSE TO STORE GLASS $267/mo x 2 units x4 months = $2,136.00 ./. 2 =		$1,068.30
	Subtotal:	$1,518.30
	Total:	**$1,518.30**

If you have any questions, please contact me at (561)863-9004.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

Delray Beach, FL Self-Storage
elf-storage-fl-delray-beach/420.html?pspid=pslocalsearch
Public Storage
enter city, state or zip
Find Storage
Large 10'x25'
$221/mo $320
Online only price
50% off first month rent
Hold Now
No Obligation
Outside unit
Drive-up access
Large 10'x20'
$226/mo $327
Online only price
$1 FIRST MONTH RENT
Hold Now
No Obligation
Outside unit
Drive-up access
Large 10'x30'
$267/mo $387
Online only price
50% off first month rent
Close
No Obligation
Outside unit
Drive-up access
No obligation to rent
All rentals month to month
No credit card required
LOCK in this rate
Make Reservation
Show pricing details
First / Last Name *
Email Address *
Move-In Date *
Phone Number *
Please text me about my reservation.
View the size guide
Unit Features
Climate Controlled
Drive Up Access
3000 Federal Highway
Delray Beach FL
* Storage of Glass *

Lisa Panico Storage of Frames

From: Gerald Holt
Sent: Monday, May 6, 2024 10:22 AM
To: Lisa Panico
Subject: FW: CRA

Lisa,
FYI

Jerry Holt
Project Manager

561-839-2831 | M • 561-212-9099
561-863-9007
jholt@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403
ahrenscompanies.com

The information contained in this message (including any attachments) may be privileged, proprietary, confidential and protected from disclosure. The information is intended to be for the use of the individual or entity designated above. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately and delete this message and all attachments from your computer and electronic devices.

From: Michael Levinson <mlevinson@millerglass.biz>
Sent: Wednesday, April 24, 2024 10:33 AM
To: Gerald Holt <jholt@ahrenscompanies.com>
Subject: CRA

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I contacted the glass fabricator, and the glass will be on 10-12 glass racks, each rack is approx. 32 square feet x 12=384 Square feet of floor space. This is the minimum we need.
We will need extra space to unload and move with a lull.

The fabricated aluminum frames take up 150 SF of floor space in our shop. We can store the frames in our shop for $225.00 per month.

Leo, our super can stop by with you to look at the space.

BILL OF SALE

PURCHASER: Ahrens companies

SELLER: Miller Glass & Glazing, Inc.

PROJECT: CRA 5th Avenue

PROJECT SITE: 95 SW 5th Ave, Delray Beach, FL 33444

PROJECT OWNER: Delray Beach Community Redevelopment Agency

PAYMENT: $75,025.00

In consideration of the payment of the Amount to Purchaser to Seller for building materials to be used in the construction of the Project for Owner at the site, (the receipt of which Amount Seller Acknowledges.) Seller does hereby grant, bargain, sell, convey, transfer, assign, and deliver to Purchaser all of the right, title, and interest of Seller in such building materials (the "Building Materials") described on Exhibit A (attached hereto) to have and to hold the Building Materials by Purchaser, its successors, and assigns forever.

Seller does hereby covenant and warrant to Purchaser, Owner, and Owner's Construction Lender, that Seller is the true and lawful owner of the Building Materials; that the Building Materials are free and clear from all encumbrances and liens; that Seller has full power and authority to sell, transfer, assign and convey all of the Building Materials, and that Seller will warrant and defend the title to all of the Building Materials unto Purchasers, its successors and assigns, against all claims and demands of all persons or parties.

Seller acknowledges that Purchaser intends to use the Building Materials as part of, or in conjunction with, the construction of the Project, and that warranties, representations, and conveyances of this Bill of Sale are also made to, and for the benefit of Owner and Owner's Construction Lender.

IN WITNESS WHEREOF, the parties hereto by their duly authorized officers, have executed and set their hands and seals to this Bill of Sale, this 6th day of March, 2024.

SELLER: Miller Glass & Glazing, Inc.

NAME: Moorehead

TITLE: Sophia Moorehead, Controller

STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged to me this 6th day of March, 2024, by Sophia Moorehead, Controller of Miller Glass & Glazing, Inc. He / She (_x_) is personally know to me or (___) has produced _____ as identification, and who did take an oath.

Notary Public, State of Florida
My commission expires:

Terri L. DeVillez
Comm. #GG962103
Expires: March 10, 2024
Bonded Thru Aaron Notary

AFFIDAVIT OF STORED MATERIALS

Miller Glass & Glazing, Inc. DOES CERTIFY AND ATTEST the following:

1. (Sub) contractors and material vendors will be paid for stored material upon receipt of payment from Delray Beach Community Redevelopment Agency("Owner")
2. Subcontractors and material vendors expressly waive and release any and all lien rights for subject stored materials, and any rights they might have to file a preliminary Notice of Lien;
3. Subcontractors and material vendors have not filed any preliminary Notices of Lien;
4. Quantity, cost, and value of stored materials are as represented;
5. The materials and/or equipment are in strict accordance with all requirements of the plans and/or specification or written approval has been received for any variations;
6. Miller Glass & Glazing, Inc. undertakes full responsibility for the care, custody, and protection of this material and/or equipment, and in the event of a loss of damage not covered by Owner's Builder's Risk Insurance they will replace in a timely manner at no coat to the Owner; and
7. Miller Glass & Glazing, Inc. agrees to transport this material and/or equipment to the place and position of final installation at its sole expense and risk, except as may be covered by owner's Builder's Risk Insurance.

(SUB) CONTRACTOR:

Miller Glass & Glazing, Inc.

NAME: Sophia Moorehead

TITLE: Sophia Moorehead, Controller

MATERIALS STORED AT: 100 Park Central Blvd South

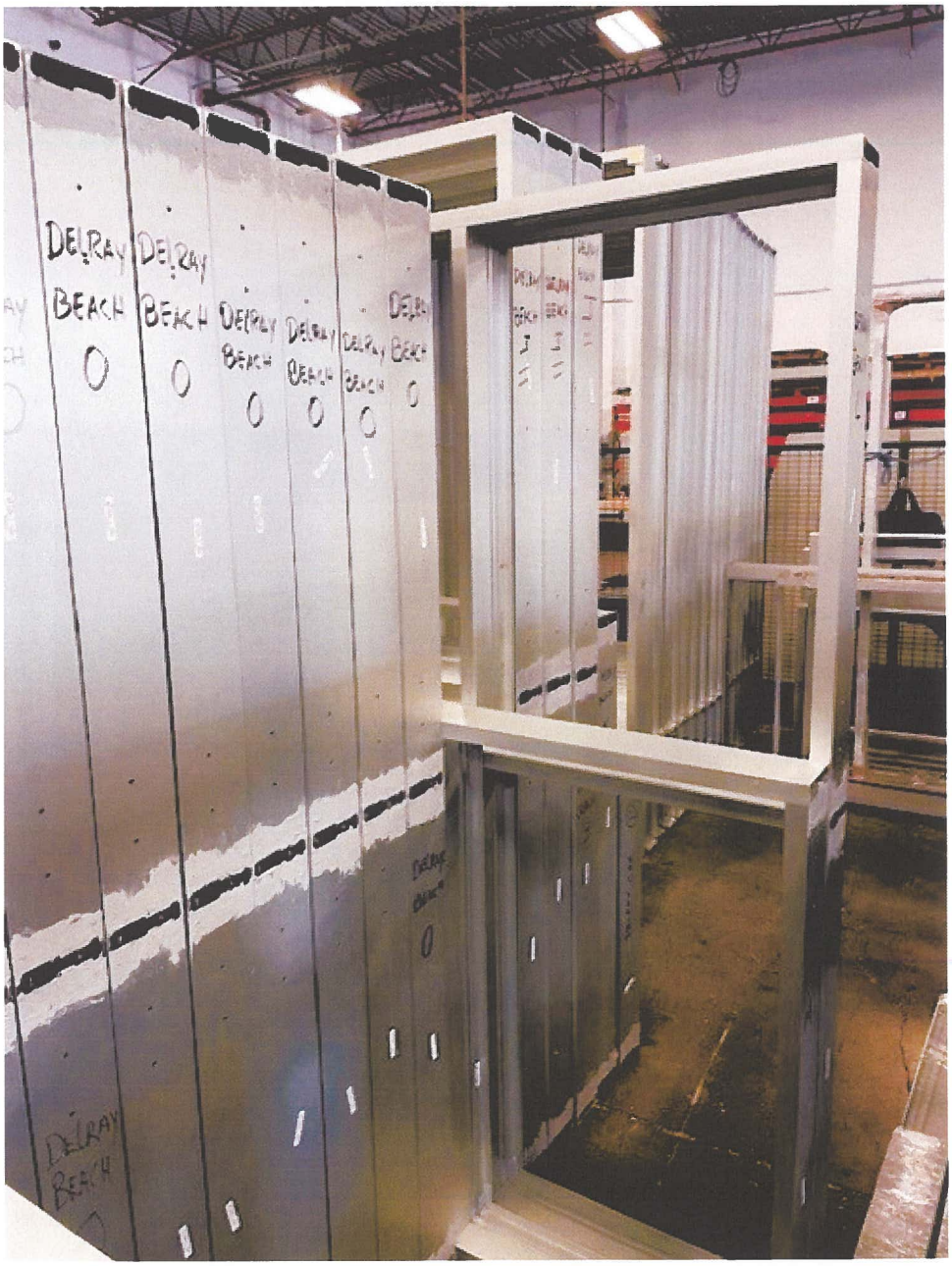
Pompano Beach, FL 33064

STATE OF FLORIDA
COUNTY OF BROWARD

The foregoing instrument was acknowledged to me this 6th day of March, 2024, by Sophia Moorehead, Controller of Miller Glass & Glazing, Inc. He / She (x) is personally know to me or (___) has produced _____ as identification, and who did take an oath.

Notary Public, State of Florida
My commission expires:

Terri L. DeVillez
Comm.#GG962103
Expires: March 10, 2024
Bonded Thru Aaron Notary


DELRAY
BEACH

DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH
DELRAY BEACH

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 14 R1
Date: 5/22/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
STORAGE OF HVAC UNITS

$1,025.00

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

STORAGE OF HVAC UNITS JUNE 2024 TO SEPTEMBER 2024 DELRAY CRA COVER 50%

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$123,260.33
The Contract Amount prior to this Change Order was	$2,863,228.33
The Contract will be changed by this Change Order in the amount of	$1,025.00
The new Contract Amount including this Change Order will be	$2,864,253.33

The Contract Time will be increased by 0 days.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens

(Signature)

Richard C. Ahrens, CEO/President

By

5/22/2024 Revised 5/23/24

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 14
Date: 5/22/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: HVAC UNITS STORAGE

Reason: Owner Request

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

STORAGE OF HVAC UNITS JUNE 2024 TO SEPTEMBER 2024 DELRAY CRA COVER 50%

Description	Price
STORAGE FOR HVAC UNITS BY KLIMATE AIR @ ALLEGIANCE CRANE AND EQUIPMENT $450.00/mo x 4 months = $1,800.00 ./. 2	$900.00
28 TON BOOM TRUCK CRANE UNLOAD AND LOAD TRANE UNIT $125.00 X 2 = 250.00 ./. 2	$125.00
Subtotal:	$1,025.00
Total:	**$1,025.00**

Please note that AHRENS COMPANIES will require an extra 0 days.

If you have any questions, please contact me at (561)863-9004.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

ALLEGIANCE
CRANE & EQUIPMENT

Allegiance Crane
954-973-3030
777 S Andrews Ave
Pompano Beach, FL 33069

Invoice

Invoice #:	1077070
Invoice Date:	4/17/2024
Due Date:	4/17/2024
Billing Date(s):	4/19/2024 - 4/19/2024

Bill To
KLIMATE AIR LLC
7315 NW 48TH CT,
LAUDERHILL , FL 33319
Account: KLIM02

Job Site
ALLEGIANCE CRANE & EQUIPMENT
777 S ANDREWS AVE
Pompano Beach, FL 33069-1416

Purchase Order #	Contact Name	Salesperson	Terms	Rental #	Cust Job #
	Kofie Wynter	Noel, Seon J	CD	174841	

Description	Quantity	Rate	Amount
28 Ton Boom Truck Crane	2	$125.00	$250.00
(2) 8X14 storage space - Monthly Rate - (4) Months January 19 - April 19, 2024	4	$450.00	$1,800.00

BT / STORAGE 777 S ANDREWS AVE 4/19

Subtotal	**$2,050.00**
Total	**$2,050.00**

Richard C. Rhea 5/10/2024

THANK YOU FOR THE OPPORTUNITY TO BE OF SERVICE TO YOU AND YOUR COMPANY
WE WELCOME FUTURE OPPORTUNITIES

Remittance Address: ALLEGIANCE CRANE & EQUIPMENT, LLC P.O. BOX 735187 DALLAS, TEXAS 75373-5187

Tel: (800) 844-9702| www.allegiancecrane.com| info@allegiancecrane.com

NOTICE OF SECURITY INTEREST / ASSIGNMENT: We have granted a security interest in, and have assigned, this lease agreement, along with all proceeds of this lease agreement, to JPMorgan Chase Bank, N.A., as agent (together with its successors and/or assigns in such capacity, "JPM"), and no security interest in this lease agreement may be created (through transfer, possession or otherwise) without obtaining the prior written consent of JPM. Further, the purchase of, or the taking of a security interest in, this lease agreement and/or the taking possession of this lease agreement by any creditor other than JPM violates the rights of JPM.

SIXTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS SIXTH AMENDMENT is hereby made and entered into this 23 day of JULY, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WITNESSETH:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the Invitation to Bid, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR entered into a First Amendment to Agreement dated April 25, 2023 to add a liquidated damages provision and clarifying certain terms of the 1TB ("First Amendment"); and

WHEREAS, CRA and CONTRACTOR entered into a Second Amendment dated October 11, 2023 to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building which increased the total sum due to the CONTRACTOR TO $2,741,468.00; and

WHEREAS, CRA and CONTRACTOR entered into a Third Amendment dated January 29, 2024 in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room; and

WHEREAS, CRA and CONTRACTOR entered into a Fourth Amendment dated February 29, 2024 in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building; and

WHEREAS, CRA and CONTRACTOR entered into a Fifth Amendment dated in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building; and

WHEREAS, CRA and CONTRACTOR desire to enter into this Sixth Amendment to modify the Builder's Risk Policy and in order to increase the compensation to the CONTRACTOR in an amount not to exceed $40,843.42 for materials and labor, to add a drywall header at the ceiling, to add a metal frame and anchors for louvers at the garage entrance, to increase the beam width from 8" to 12" on the East and West sides of the roof and for modification to the builders risk insurance; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the compensation to the CONTRACTOR in an amount not to exceed $40,843.42 for materials

and labor, to add a drywall header at the ceiling, to add a metal frame and anchors for louvers at the garage entrance, to increase the beam width from 8" to 12" on the East and West sides of the roof and for modification to the builders risk insurance and as further set forth in the Change Order attached as Exhibit "A" to this Sixth Amendment, which is incorporated herein by reference. The total sum due to the CONTRACTOR is amended to $2,905,096.74.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, and Fifth Amendment. The First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment and this Sixth Amendment shall remain in full force and effect, except as amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, the First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment and this Sixth Amendment, this Sixth Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Sixth Amendment to the Agreement on the date first written above

ATTEST:

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Renée A. Jadusingh, Executive Director

Approved as to Form:

CRA Legal Counsel

THIS SECTION INTENTIONALLY LEFT BLANK, SIGNATURE PAGE TO FOLLOW

ATTEST:

Print Name: Judy Ahrens

Title: Vice President

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: President/CEO

(SEAL)

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this 15 day of JULY, 2024, by RICHARD C. AHRENS, as PRESIDENT/CEO (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification

BONNIE DANIELS
MY COMMISSION # HH521550
EXPIRES: May 27, 2028

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 15
Date: 5/22/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SUPPLY AND INSTALL DRYWALL HEADER AT CEILING

$1,049.01

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE , NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY AND INSTALL DRYWALL HEADER AT CEILING ADDED BY RFI #42

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$124,285.33
The Contract Amount prior to this Change Order was	$2,864,253.33
The Contract will be changed by this Change Order in the amount of	$1,049.01
The new Contract Amount including this Change Order will be	$2,865,302.34

The Contract Time will be increased by 2 days.
The date of Substantial Completion as of the date of this Change Order therefore is 9/1/2024

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

Richard C. Ahrens, CEO/President
By
5/22/2024
Date

OWNER

(Signature)
By
Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 15
Date: 5/21/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SUPPLY AND INSTALL DRYWALL HEADER AT CEILING

Source: RFI # RFI#42

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE , NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY AND INSTALL DRYWALL HEADER AT CEILING ADDED BY RFI #42

Description		Price
DRYALL\ FRAMING WORK COMPLEATED BY K&S INTERIORS		$940.00
AHRENS FEE 10%		$90.40
GENERAL LIABILITY 1.33		$12.50
BUIDERS RISK 0.065%		$6.11
	Subtotal:	$1,049.01
	Total:	**$1,049.01**

Please note that AHRENS COMPANIES will require an extra 2 days.

If you have any questions, please contact me at (561)863-9004.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

2000 Avenue P, Suite 15
Riviera Beach, Fl 33404
Phone: (561) 848-5300
Fax: (561) 848-5588
License U-19145

CHANGE ORDER

CO #: 2

DATE: 03/21/24

PROJECT: Delray Beach CRA Development
23-035

TO: Ahrens Companies
1461 Kinetic Rd.
Lake Park, FL 33403
Attn: John Mangubat
Ph: (561) 863-9004 Fax: (561) 863-9007

THE ITEMS LISTED BELOW REPRESENT CHANGES OR EXTRAS TO THE CONTRACT THAT YOU HAVE REQUESTED. IN ORDER FOR THESE EXTRAS TO BE INCORPORATED INTO THE CONTRACT, PLEASE SIGN ONE COPY OF THIS CHANGE ORDER AND RETURN IT AS SOON AS POSSIBLE.

- RFI#42- Additional Headers: 3-5/8" 20 Ga Metal Framing 16" o/c with 5/8" Type X Gyp Bd to 6" Above Ceiling.

TOTAL ADDITIONAL COST: $ 940.00

TOTAL INCREASED CONTRACT TIME:

WE THE UNDERSIGNED, AGREE TO THE ABOVE CHANGES TO BE MADE BY K&S INTERIORS, INC. IN THE CONSTRUCTION OF THE PROJECT INDICATED.

*****THIS MUST BE SIGNED AND RETURNED WITHIN TWO (2) WORKING DAYS TO AVOID DELAYS AND ADDITIONAL EXPENSE. WORK WILL PROCEED ACCORDING TO THE ORIGINAL CONTRACTUAL AGREEMENT UNTIL THIS CHANGE ORDER BECOMES EFFECTIVE. *****

K & S INTERIORS, INC. **AHRENS COMPANIES**

Scott L. Mills, Sr, President

John Mangubat Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **16R1**
Date: 5/22/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SUPPLY AND INSTALL METAL BEAM BELOW LOUVERS AT GARAGE ENTRANCE

$6,281.29

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 07/18/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE , NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY AND INSTALL 4" x 8" x 1/4" TUBE STEEL BEAM BELOW LOUVERS AT GARAGE ENTRANCE .
THIS CHANGFE IS SHOWN ON DRWING A-802, DETAIL 28, REVISION #3, DATED 5/31/2024.

OAC MEETING THE ARCHITECT ACCEPTED THE CHANGE IN THICKNESS FROM 3/16" AS SHOWN ON REVISION TO 1/4"

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$125,334.34
The Contract Amount prior to this Change Order was	$2,865,302.34
The Contract will be changed by this Change Order in the amount of	$6,281.29
The new Contract Amount including this Change Order will be	$2,871,583.63

The Contract Time will be increased by 2 days.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER . CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

5/22/2024 REVISED

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 16R1
Date: 5/22/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SUPPLY AND INSTALL METAL BEAM BELOW LOUVERS AT GARAGE ENTRANCE

Reason: Design Change

Initiated by: Jerry Holt (AHRENS COMPANIES)

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 07/18/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY AND INSTALL 4" x 8" x 1/4" TUBE STEEL BEAM BELOW LOUVERS AT GARAGE ENTRANCE .
THIS CHANGFE IS SHOWN ON DRWING A-802, DETAIL 28, REVISION #3, DATED 5/31/2024.

OAC MEETING THE ARCHITECT ACCEPTED THE CHANGE IN THICKNESS FROM 3/16" AS SHOWN ON REVISION TO 1/4"

Description		Price
MATERIAL: 4" X 8" X 1/4" TUBE STEEL BEAM		$2,070.00
SALES TAX		$144.90
EQUIPMENT RENTAL		$850.00
LABOR TO INSTALL 24 HOURS X 79.00 PER HOUR		$1,896.00
PAINT BEAM		$450.00
ANCHOR BOLTS 16 EACH @ $12.40		$198.40
AHRENS FEE 10% X $5,609.30		$560.93
GENERAL LIABILITY 1.33% X $5,609.30		$74.60
BUILDERS RISK 0.65 X $5,609.30		$36.46
	Subtotal:	$6,281.29
	Total:	**$6,281.29**

Please note that AHRENS COMPANIES will require an extra 2 days.

If you have any questions, please contact me at (561)863-9004.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

From: Fab-Rite Inc <fabriteinc1987@gmail.com>
Sent: Monday, June 3, 2024 3:38 PM
To: Jim Graveline <jgraveline@ahrenscompanies.com>
Cc: Gerald Holt <jholt@ahrenscompanies.com>; Lisa Panico <Lpanico@ahrenscompanies.com>
Subject: Re: Delray Steel Bid

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I can offer 8x4x1/4" tube $2070.00 + Tax

Thank you,

Jim

FAB-RITE, INC.

4636 Dyer Blvd.
West Palm Beach, FL 33407
Phone: 561-848-8181
Fax: 561-848-5711

On Mon, Jun 3, 2024 at 2:17 PM Jim Graveline <jgraveline@ahrenscompanies.com> wrote:

OK Fabrication it is.

Thank You,

JimGraveline

Project Manager

305.874 9137

Gerald Holt

From: Fab-Rite Inc <fabriteinc1987@gmail.com>
Sent: Wednesday, March 27, 2024 8:05 AM
To: Gerald Holt
Cc: Susie Cirillo; Christina Berry
Subject: Re: Delray - Steel bid

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Using 4x12x3/8" tube
2 stub columns 1970.00 + Tax
1 beam 2600.00 + Tax

Material on mill floor in Canada, eta 3 weeks.
Thank you,
Jim

FAB-RITE, INC.
4636 Dyer Blvd.
West Palm Beach, FL 33407
Phone: 561-848-8181
Fax: 561-848-5711

On Mon, Mar 25, 2024 at 3:02 PM Gerald Holt <jholt@ahrenscompanies.com> wrote:

Jim,

Can you please price these two items. We need separate costs for each item. One cost for the 2 each 20" stub columns and a separate cost for one of the 25'-3" HSS beam. All made with the 4"x12" tube. What are the common thicknesses of this 4"x 12" tube ? is 3/8" a common thickness ? If so use 3/8" thick tubes.

AHRENS

Jerry Holt
Project Manager
561-839-2831 | M 561-212-9099
561-863-9007
jholt@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403
ahrensccompanies.com

REVISED

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 17
Date: 5/22/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
INCREASE BEAM WIDTH FROM 8" TO 12" WIDE EAST & WEST SIDES OF THE ROOF

$2,967.47

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

INCREASE THE BEAM WIDTH FROM 8" TO 12" ON EASET AND WEST SIDES OF THE ROOF.
THIS IS REVISED UNDER RFI #54

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$125,334.34
The Contract Amount prior to this Change Order was	$2,865,302.34
The Contract will be changed by this Change Order in the amount of	$2,967.47
The new Contract Amount including this Change Order will be	$2,868,269.81

The Contract Time will be increased by 0 days.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)
Richard C. Ahrens, CEO/President
By
5/22/2024
Date

OWNER

(Signature)
By
Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 17
Date: 5/22/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: INCREASE BEAM WIDTH FROM 8" TO 12" WIDE @ EAST AND WEST SIDE OF ROOF

Reason: Design Change

Initiated by: Jerry Holt (AHRENS COMPANIES)

Source: RFI # RFI #54

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED BY 5/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

INCREASE THE BEAM WIDTH FROM 8" TO 12" ON EASET AND WEST SIDES OF THE ROOF.
THIS IS REVISED UNDER RFI #54

Description		Price
WORK COMPLETED BY LTI CONCRETE		$2,650.00
AHRENS FEE 10%		$265.00
GENERAL LIABILITY 1.33%		$35.25
BUILDER RISK 0.65%		$17.22
	Subtotal:	$2,967.47
	Total:	**$2,967.47**

If you have any questions, please contact me at (561)863-9004.

Submitted by: Jerry Holt
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

Gerald Holt

From: Cody Person <codyplticonstruction@gmail.com>
Sent: Wednesday, May 22, 2024 3:03 PM
To: Gerald Holt
Subject: Delray CRA

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

For the East and West beams to be changed to 12" wide the cost is $2650.

This email has been scanned for spam and viruses by Proofpoint Essentials. Click here to report this email as spam.

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 18
Date: 6/30/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
BUILDERS RISK EXTENTION 6/4/2024 - 11/21/2024

$30,545.65

EXTEND BUILDERS RISK POLICY FROM JUNE 4TH, 2024 TO NOVEMBER 21, 2024 AS PER AMMENDMENT#5.
SEE ATTACHED BACK UP DOCUMENTS

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$124,285.33
The Contract Amount prior to this Change Order was	$2,864,253.33
The Contract will be changed by this Change Order in the amount of	$30,545.65
The new Contract Amount including this Change Order will be	$2,894,798.98

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

6/30/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 18
Date: 6/30/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: BUILDERS RISK EXTENTION

Reason: Owner Request

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Other # AMMENDMENT #

We are pleased to offer the following specifications and pricing to make the following changes:

EXTEND BUILDERS RISK POLICY FROM JUNE 4TH, 2024 TO NOVEMBER 21, 2024 AS PER AMMENDMENT#5.
SEE ATTACHED BACK UP DOCUMENTS

Description	Price
BUILDERS RISK EXTENTION 6/4/2024 - 11/21/2024	$30,545.65
Subtotal:	$30,545.65
Total:	**$30,545.65**

If you have any questions, please contact me at (561)863-9004.

Submitted by: JUDY AHRENS
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

From: Judy Ahrens <JAhrens@ahrenscompanies.com>
Sent: Tuesday, June 18, 2024 6:00:59 PM
To: Tibbs, Christine <tibbsc@mydelraybeach.com>; Cabrera, Ivan <cabrerai@mydelraybeach.com>
Cc: Weber, Mackenzie <WeberM@mydelraybeach.com>; Richard Ahrens <richard@ahrenscompanies.com>; Gerald Holt <jholt@ahrenscompanies.com>
Subject: AMENDMENT#5 AND SUPPORTING DOCUMENTS

****Please be cautious****
This email originated from outside of The City of Delray Beach. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Christine,
Please see the attached Fifth Amendment with supporting documents.
Bid Bond Extension, Certificate of Insurance and Policy documents.
I will forward the Bound Policy docs as soon as available.

When renewing the Builders Risk Policy, it was discovered that the original Builders Risk Policy was not bound by the insurance company.
The policy attached is a new policy as opposed to a renewal. I am not sure where the communication breakdown was with the Insurance company and our office as I was not involved with request of proposal and binding of the policy docs at that time. I searched for the COI and policy docs that may have been forwarded to the CRA at the inception of the contract and found none. It must have fallen thru the cracks by both the CRA and AHRENS. My apologies for the oversite on AHRENS part.

With that being said, there were no losses during the time of contract execution to date for which AHRENS has attested (document attached). The line item for Builders Risk is $20,580.00 for which the CRA has paid in full. We will apply this total to the renewal cost of $51,821.50. The CRA has paid thru Change Orders $695.85 in Builders Risk Fees to date. Total paid in reducing Change Order amount to $30,545.65. Please keep in mind that the policy is being written to cover Hurricane Season which increases the policy premium considerably. In addition, the value of the project has increased by $120,000.00 +. I will forward a formal change order.

If you have any questions, please give me a call to discuss.
Thank you.

Judy Ahrens
Vice President

AHRENS
Your Design/Build – Construction Firm
561-839-2822 / 561-863-9007
jahrens@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403

striior

INSURANCE SOLUTIONS

☐ QUOTATION ☒ BINDER **DATE:** 06/20/2024

COMPANY POLICY NUMBER: CSN0015754

NOTICE: The Company offering coverage is a Surplus Lines insurer, regulated by Surplus Lines insurance laws. It is the responsibility of the Surplus Lines Broker to ensure those laws are followed, and to collect and remit any applicable taxes, surcharges, stamping or other fees.

NAMED INSURED:	Ahrens Enterprises, Inc. dba AHRENS Companies
MAILING ADDRESS:	1461 Kinetic Rd West Palm Beach, FL 33403

ISSUING COMPANY (the "Company"):

As Per Schedule of Insurers

COMPANY FINANCIAL RATINGS:

AM Best: "A"

PRODUCER:

AmWINS

7108 Fairway Drive, suite 200

Palm Beach Gardens, FL 33418

Attn: Tanya Morales

ADDITIONAL INSURED:

Delray Beach CRA Development, 95 SW 5th Avenue, Delray Beach, FL 33444

LOSS PAYABLE: Insured

INSURED PROJECT LOCATION:

95 SW 5th Ave, Delray Beach, FL 33444

INSURED PROJECT DESCRIPTION:

Mid-term new construction of a 2 story, masonry noncombustible, 7,089 sq. ft. office building. Work is 44% complete. Work completed includes shell of first floor and second floor. They are currently completing roofing.

POLICY PERIOD:

Effective Date: 06/04/2024 at 12:01 am

Expiration Date: 11/21/2024 at 12:01 am

Standard Time at the location of the Insured Project.

Project Term: 170 days

POLICY FORM: HTKC001 Builders Risk Coverage Form

ESTIMATED TOTAL COMPLETED VALUE* OF INSURED PROJECT* AT POLICY INCEPTION:

Hard Costs	$2,739,968
Owner Supplied Material	Not Covered
Existing Structures	Not Covered
Loss of **GROSS EARNINGS***	Not Covered
Loss of **RENTAL INCOME***	Not Covered
SOFT COSTS/ADDITIONAL EXPENSES*	Not Covered
Estimated **TOTAL COMPLETED VALUE*** of **INSURED PROJECT***	$2,739,968

Subject to premium adjustment at completion of the project

PARTICIPATION: **100.00**% being **$2,739,968** part of **$2,739,968**

POLICY LIMIT: The Company will not be liable for more than its proportion of **$2,739,968** in any one **OCCURRENCE*** and further subject to its proportion of the following limits, sublimits and aggregate limits:

POLICY SUBLIMITS & AGGREGATE LIMITS:

Hard Costs	$2,739,968
Owner Supplied Material	Not Covered
Existing Structures	Not Covered
Loss of **GROSS EARNINGS***	Not Covered
Loss of **RENTAL INCOME***	Not Covered
SOFT COSTS/ADDITIONAL EXPENSES*	Not Covered
Transit **(per conveyance)**	$100,000
Offsite Temporary Storage and/or Offsite Fabrication **(per location)**	$100,000
Expediting Expense	Lesser of 25% of the Loss or $100,000
Trees, Shrubs, Plantings and Landscaping	$50,000
Plans, Blueprints, Drawings, Electronic Data, Renderings, Specifications or Other Contract Documents and Modelss	$25,000
Fire Fighting Charges & Extinguishing Expenses	$25,000
Debris Removal	Lesser of 25% of the Loss or $100,000
Ordinance & Law / Demolition & Increased Cost of Construction	$250,000
Extra Expense	Not Covered
Pollution & Contamination Cleanup & Decontamination **(Policy Aggregate)**	$10,000
Claim Preparation Costs	$25,000
MOLD* & **FUNGUS*** Remediation **(Policy Aggregate)**	$10,000
Architects and Engineers Fees	$25,000
EARTH MOVEMENT* ☒ annual aggregate ☐ policy aggregate	$2,739,968
FLOOD* ☒ annual aggregate ☐ policy aggregate	$2,739,968
The above sub-limits outlined for Flood are included within the general aggregate for Flood and do not increase the Limits of Liability.	
WINDSTORM* ☐ annual aggregate ☒ no aggregate ☐ policy aggregate	$2,739,968
NAMED WINDSTORM* ☐ annual aggregate ☒ no aggregate ☐ policy aggregate	$2,739,968

TIME LIMITS:	
Hot Testing Period	Not Covered
Periods of Occupancy or Commercial Service	4 Consecutive Weeks
Period of Indemnity for Delay in Completion	Not Covered

1. In no event shall these sublimits of liability increase the Limit of Liability. Sublimits are part of the policy limit, not in addition thereto.

2. Application of all sublimits is per occurrence unless noted otherwise.
3. Coverage shall only apply when a sub-limit is shown under Policy Sublimits & Aggregate Limits section.
4. Coverage is excluded when a sublimit is shown as Not Covered.
5. When a sublimit indicates an annual aggregate applies, the sublimit shown is the most we will pay for **LOSS*** during a policy year.

DEDUCTIBLES:

The applicable amount shown below shall be deducted for each claim arising from insured **LOSS*** or damage in any one **OCCURRENCE***. The Company shall be liable only for its proportion of the amount of insured **LOSS*** or damage in excess thereof, subject to all terms and conditions of the policy.

Physical **LOSS*** of or Damage to Property Insured	$25,000
WATER DAMAGE* and **SURFACE WATER***other than **FLOOD***	$250,000
Collapse	$50,000
FLOOD*	10% of the total insured values at risk at the time and place of loss subject to a minimum deduction of $250,000 as respects the peril of **FLOOD***
EARTH MOVEMENT*	$50,000
WINDSTORM*	10% of the total insured values at risk at the time and place of loss subject to a minimum deduction of $250,000 as respects the peril of **WINDSTORM***
NAMED WINDSTORM*	10% of the total insured values at risk at the time and place of loss subject to a minimum deduction of $250,000 as respects the peril of **NAMED WINDSTORM***
Hot Testing	Not Covered
WAITING PERIOD* for Delay in Completion	Not Covered

1. For any coverage where a deductible is not shown, the standard Physical **LOSS*** of or Damage to Property Insured" deductible shall apply.
2. When a percentage (%) is entered absent a corresponding minimum dollar amount, the percentage shall be applied without minimum. When a dollar amount is entered absent a corresponding percentage (%), the word minimum is deleted.
3. In the event that more than one deductible applies in any one occurrence, only the largest shall be applied.

ANNUAL RATES (unless noted otherwise):

Flat/$100 Physical Damage
NC/$100 Physical Damage Existing Structures
Included/$100 Flood
Included/$100 Earth Movement
Included/$100 Named Windstorm if applicable (Monthly Rate effective from June 1st to November 30th
NC/$100 Loss of Gross Earnings
NC/$100 Loss of Rental Income
NC/$100 Soft Costs
NC/$100 Hot Testing (Monthly)

Note: Rates are applied against declared estimated total contract values and estimated project term

PREMIUM AND FEE(S)	
Total Term Policy Premium:	$47,350
Total Certified Terrorism Premium:	Not Covered
Policy Administration Fee:	$1,500
Total Policy Premium and Fee(s):	$48,850

PREMIUM:

1. Cancellation: 30 days except 10 days for non-payment of premium. (Subject to 10% short rate cancellation if Insured cancels the policy.)
2. Premium Payment Terms: Premium is payable within 30 days of Policy Inception.
3. 100% of the premium is fully earned on the Effective Date, and not subject to return or refund.
4. Applicable Surplus Lines taxes and fees are in addition to the premiums stated above.
5. The Producer shown above is responsible for adding to the quoted premium any state taxes or fees as required by law. The Producer is further responsible for all filings with any state regulatory body including but not limited to affidavits, tax summaries, taxes and fees.
6. Where applicable, the Producer must provide the Surplus Lines Association (SLA) number at binding.
7. The Producer is responsible for all required diligent searches and filing of Form SL-2. A copy of Form SL-2 must be provided to the Company upon binding.

POLICY TERRITORY: While located at the location of the **INSURED PROJECT*** and while in transit within and / or offsite storage within the fifty (50) states comprising the United States of America, and within the District of Columbia including the territorial coastal waters of any of the foregoing.

PERILS INSURED: All risks of direct physical **LOSS*** of or damage to property insured while at the location of the **INSURED PROJECT*** subject to the terms, conditions and exclusions in the HTKC001 Builders Risk Coverage Form.

VALUATION: As per HTKC001 Builders Risk Coverage Form

POLICY FORMS & ENDORSEMENTS APPLICABLE:

HTKP002	Schedule of Insurers
HTKC001	Builders Risk Coverage Form
HTKE083	Chemical, Biological, Nuclear, and Radioactive Explosion, Pollution, or Contamination Exclusion
HTKE084	Asbestos Endorsement
HTKE078	Cyber Loss Limited Exclusion

OTHER TERMS APPLYING:

Jobsite must be secured by a fence no less than six (6) feet in height that completely surrounds the jobsite with no openings unless gated. Any such gates must be closed and locked during all non-working hours.
Jobsite must be lighted such that the entire perimeter of the jobsite is illuminated during all non-working hours.

Any deviation(s) from the above terms could be considered a material increase in hazard that changes the insurability of the risk and/or the premium quoted. The Company must be notified of such deviation(s) and the insured will, on demand, pay the premium for such increased hazard for the term of the use thereof, otherwise this policy will be null and void.

COMMENTS:

Additional Terms and Conditions:

1. This quotation or binder is based upon the information provided in the submission and subsequent documentation. The terms and conditions of this quotation or binder take precedence over any other terms and conditions in the submission. Please review this document carefully.

2. If there is any material change in the loss history or other pertinent underwriting information we reserve the right to amend or withdraw this quotation or binder.

3. This quotation or binder is conditioned upon your agreement to accept delivery of the policy and any endorsements and policyholder notices by electronic means. Your acceptance of this quotation or binder signifies your agreement to this.

4. The Company reserves the right to conduct inspections of insured properties.

5. Terrorism – Coverage is available at your option. You must choose to accept or reject coverage.

(a) If you Accept coverage you must advise us at binding and add the premium shown on the attached Disclosure Notice to other premiums stated herein and remit to the Company within 30 days.

(b) If you Reject coverage, you must sign the attached Disclosure Notice and return it to the Company immediately. If you reject coverage All Terrorism coverage will be excluded.

6. This document will be valid until 60 days from date of quotation. Because the general underwriting requirements of the Company may change, we reserve the right to withdraw or amend this document and proposal at any time.

7. An Indication is an expression of interest in writing the account subject to the pricing, terms and conditions set forth in the Indication, but does not constitute a Quotation. An Indication does not constitute an offer to provide the insurance, nor may a binder be issued based upon an Indication. When this document is presented as a Quotation and not an Indication then it is an offer to provide insurance but does not constitute a binder. Coverage can only be bound on behalf of when confirmed in writing by the undersigned or their authorized designee and then based strictly on the terms and conditions outlined in this document unless otherwise modified and confirmed in writing at or prior to the time of binding.

8. Office of Foreign Assets Control (OFAC) Disclosure Notice:
This proposal or resulting binder, the continuation of any bound insurance, and any payments to you, to a claimant or to another third party, may be affected by the administration and enforcement of U.S. economic embargoes and trade sanctions by the office of Foreign Assets Control (OFAC), if we determine that any such party is on the "Specialty Designated Nationals or Blocked Persons" list as maintained by Office of Foreign Assets Control.

When this document is presented as a binder as indicated on Page 1, items number 6 and 7 above are deleted.

ADDITIONAL UNDERWRITING INFORMATION REQUIRED AS A CONDITION OF BINDING COVERAGE AND UNLESS NOTED BELOW DUE WITHIN THIRTY (30) DAYS OF BINDING WITH THE COMPANY.

If an item is checked (x) below it is a required part of the basis for the terms and conditions set forth herein. Any item(s) outstanding at the time a binder is requested may be cause for withdrawal or amendment of these terms and conditions

☒ Signed Tria Accepted or Rejected
☒ Striior New Business Binding Application
☒ Line Item Breakdown of Contract Award Amount
☒ Most current CPM Schedule, Critical Path or Bar Chart / Time Line
☒ Site or Plot Plan
☒ Loss History of Contractor (5 years)
☒ Statement of contractor experience with similar projects
☒ Pictures of existing structure and/or between structure and Project Site
☒ No Known Loss or Reported Loss Letter Prior to Binding Coverage

Surplus Lines Agent's Name: Susan Brown Flemming
Surplus Lines Agent's Address: 1227 S. Patrick Drive
Satellite Beach, FL 32937
Surplus Lines Agent's License #: A085932
Producing Agent's Name: Ashley Dyer
Producing Agent's Address: 23 Eganfuskee Street Suite 102
Jupiter FL 33477

This insurance is issued pursuant to the Florida Surplus Lines Law. Persons insured by surplus lines carriers do not have the protection of the Florida Insurance Guaranty Act to the extent of any right of recovery for the obligation of an insolvent unlicensed insurer.

Premium: $47,350.00 Tax: $2,437.89 Service Fee: $29.61
EMPA Surcharge: $4.00 Broker Fee: $500.00
Inspection Fee: _____ Policy Fee: $1,500.00

Surplus Lines Agent's Countersignature: Susan Flemming

POLICYHOLDER DISCLOSURE
NOTICE OF TERRORISM
INSURANCE COVERAGE

You are hereby notified that under the Terrorism Risk Insurance Act of 2002, as amended ("TRIA"), that you now have a right to purchase insurance coverage for losses arising out of acts of terrorism, **as defined in Section 102(1) of the Act, as amended:** The term "act of terrorism" means any act that is certified by the Secretary of the Treasury, in consultation with the Secretary of Homeland Security and the Attorney General of the United States, to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of an air carrier or vessel or the premises of a United States mission; and to have been committed by an individual or individuals, as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion. Any coverage you purchase for "acts of terrorism" shall expire at 12:00 midnight December 31, 2027, the date on which the TRIA Program is scheduled to terminate, or the expiry date of the policy whichever occurs first and shall not cover any losses or events which arise after the earlier of these dates.

YOU SHOULD KNOW THAT COVERAGE PROVIDED BY THIS POLICY FOR LOSSES CAUSED BY CERTIFIED ACTS OF TERRORISM IS PARTIALLY REIMBURSED BY THE UNITED STATES UNDER A FORMULA ESTABLISHED BY FEDERAL LAW. HOWEVER, YOUR POLICY MAY CONTAIN OTHER EXCLUSIONS WHICH MIGHT AFFECT YOUR COVERAGE, SUCH AS AN EXCLUSION FOR NUCLEAR EVENTS. UNDER THIS FORMULA, THE UNITED STATES PAYS 80% OF COVERED TERRORISM LOSSES EXCEEDING THE STATUTORILY ESTABLISHED DEDUCTIBLE PAID BY THE INSURER(S) PROVIDING THE COVERAGE. YOU SHOULD ALSO KNOW THAT THE TERRORISM RISK INSURANCE ACT, AS AMENDED, CONTAINS A USD100 BILLION CAP THAT LIMITS U.S. GOVERNMENT REIMBURSEMENT AS WELL AS INSURERS' LIABILITY FOR LOSSES RESULTING FROM CERTIFIED ACTS OF TERRORISM WHEN THE AMOUNT OF SUCH LOSSES IN ANY ONE CALENDAR YEAR EXCEEDS USD100 BILLION. IF THE AGGREGATE INSURED LOSSES FOR ALL INSURERS EXCEED USD100 BILLION, YOUR COVERAGE MAY BE REDUCED.

THE PREMIUM CHARGED FOR THIS COVERAGE IS PROVIDED BELOW AND DOES NOT INCLUDE ANY CHARGES FOR THE PORTION OF LOSS COVERED BY THE FEDERAL GOVERNMENT UNDER THE ACT.

☐	I hereby elect to purchase coverage for acts of terrorism for a prospective premium of USD Not Covered
☒	I hereby elect to have coverage for acts of terrorism excluded from my policy. I understand that I will have no coverage for losses arising from acts of terrorism.

If your policy includes Inland Marine coverage in one or more of these states: CA, ME, MO, OR or WI the following statement applies:

The terrorism exclusion makes an exception for (and thereby continues your coverage for) direct property damage fire losses resulting from an act of terrorism. Therefore, if you reject the offer of terrorism coverage, that rejection does not apply to direct property damage fire losses resulting from an act of terrorism - the coverage in your policy for such fire losses will continue. If such a loss occurs, and is certified under the Act, the loss will be reimbursed by the United States Government under the formula detailed above.

The portion of your policy premium attributable to coverage for direct property damage from fire resulting from terrorism in all of the states listed above, in which your policy provides Inland Marine coverage, is **Included**. This amount is included in your policy premium and cannot be rejected.

	As Per Schedule of Insurers
Policyholder/Applicant's Signature	Insurance Company
Print Name	Date

If you have any questions about this notice, please contact your agent.

striior
INSURANCE SOLUTIONS

SCHEDULE OF INSURERS

The Insurer(s) and their participation in this policy are as follows:

Insurer	Participation
Homeland Insurance Company of New York	100.000%

striior
INSURANCE SOLUTIONS

BUILDERS RISK COVERAGE FORM

Words or phrases that appear in capitalized **bold** face type followed by an Asterisk have special meaning that will be applied in the interpretation of such words or phrases in accordance with Part C – Definitions. In addition, throughout this policy, the words "you" and "your" refer to the Named Insured shown in Item 1 of the Policy Declarations, the term "policy period" refers to the Policy Period shown in Item 5 of the Policy Declarations, and the word "Company" refers to the Issuing Company identified in the Policy Declarations.

Various Provisions in this policy restrict coverage. Read the entire policy carefully to determine rights, duties and what is and is not covered.

PART A – COVERAGE TERMS AND CONDITIONS

1. INSURING AGREEMENT:

This policy, subject to the terms, exclusions, limitations and conditions contained herein or endorsed hereto, insures against **LOSS*** to **PROPERTY INSURED*** while at the location of the **INSURED PROJECT*** while in offsite temporary storage, offsite fabrication or while in transit, all within the **COVERAGE TERRITORY*** and occurring during the policy period, unless the cause of such **LOSS*** is Excluded and/or Limited by this policy form. The most the Company will pay in any one **OCCURRENCE*** is its proportion of the Policy Limit described in Paragraph 9 (POLICY LIMIT) of the Builder's Risk Policy Declarations ("Declarations"), subject to the participation, sub-limits and aggregate limits set forth in Paragraph 10 (PARTICIPATION) of the Declarations, and further subject to the deductible provisions set forth in Paragraph 11 (DEDUCTIBLES) of the Declarations.

2. EXTENSIONS OF COVERAGE: (*Coverage is excluded when shown as Not Covered on the Declarations)*

A. ARCHITECTS AND ENGINEERS FEES:

In the event of **LOSS*** insured hereunder and occurring during the policy period, this policy is extended to cover necessary and reasonable compensation for architect's or engineer's services and expenses incurred by the Insured in connection with the repair or replacement of the **INSURED PROJECT***, but excluding any architectural, engineering, drafting or other cost, expense or fees including change orders and shop drawings relating to improvements or betterments to the **INSURED PROJECT***.

B. CLAIM PREPARATION COSTS:

This policy is extended to cover the reasonable and necessary additional expenses incurred by the Insured which are directly related to the preparation, substantiation and / or documentation of any claim for **LOSS*** insured hereunder and occurring during the policy period to **PROPERTY INSURED***as a result of a covered cause of **LOSS*** under this policy. Any costs incurred for the services or efforts of an attorney, lawyer or a Public Adjuster are expressly excluded.

The Company shall have no liability for any additional expense hereunder unless and until a claim for **LOSS*** to **PROPERTY INSURED***as a result of a covered cause of **LOSS*** under this policy has been submitted to and accepted by the Company.

Any costs incurred hereunder shall be subject to the deductible applicable to the cause of **LOSS*** that necessitates such costs. In the event that the amount of **LOSS*** to **PROPERTY INSURED*** as a result of a covered cause of **LOSS***

under this policy is less than the applicable deductible stated elsewhere in this policy, the Company shall not accept a claim for nor be liable for additional expenses as covered herein.

C. COLD TESTING: Limit – Up to Policy Limit

Any functional testing, exclusive of hot testing as defined within the hot testing extension of coverage section, including but not limited to electrical, mechanical, hydraulic and hydrostatic.

Startup and testing of building systems including heating, lighting, air conditioning, plumbing, electrical **WORK***, ventilation, sprinkler systems, plumbing, gas line, elevators and escalators shall be considered cold testing**.**

D. CONSTRUCTION TRAILERS: Limit – $25,000

The company will pay for **LOSS*** to construction trailers and trailer contents, other than "construction documentation, records, tools and equipment", while at the **INSURED PROJECT*** site or a temporary offsite location caused by a covered **LOSS***.

Construction trailers means modular or portable office trailers, construction trailers, storage trailers or portable restrooms.

E. CRANE RE-ERECTION EXPENSE: Limit – $25,000

If a crane which is equipped with a winch for hoisting loads is not covered under this policy is damaged as a result of a covered **LOSS*** while at the **INSURED PROJECT*** site, the company will pay the reasonable and necessary costs incurred by the Named Insured to re-erect a crane if necessary to complete the **INSURED PROJECT***.

This extension of coverage does not apply to and shall not modify, amend or alter any other coverage extension or delay in opening coverage insured by the policy and such coverage extension and delay in opening coverage is expressly excluded.

F. DEBRIS REMOVAL:

In the event of a covered **LOSS*** and occurring during the policy period, the Company will pay the following necessary and reasonable costs:

(1) Costs to remove debris being an insured part of the property from **INSURED PROJECT***; and/or

(2) Cost of cleanup, at the **INSURED PROJECT***, made necessary as a result of such **LOSS***.

Debris Removal does not apply to costs to:

(a) Remove debris of property of yours that is not insured under this policy, or property in your possession that is not **PROPERTY INSURED***;

(b) Remove debris of property owned by or leased to or for the owner of the **INSURED PROJECT*** where the described premises are located, unless you have a contractual responsibility to insure such property and it is insured under this policy;

(c) Remove any property that is specifically excluded in this policy.

(d) Remove property of others of a type that would not be **PROPERTY INSURED*** under this Coverage Form;

(e) Extract **CONTAMINANTS OR POLLUTANTS*** from land or water; or

(f) Remove, restore or replace polluted land or water.

It is a condition precedent to recovery under this extension that the Company shall have paid or agreed to pay for **LOSS*** to the **PROPERTY INSURED*** hereunder and that the Insured shall give written notice to the Company of intent to claim for cost of covered removal of debris or cost to clean up not later than **one hundred eighty (180)** days after the date of such **LOSS***.

G. ERRORS AND OMISSIONS: Limit – $25,000

No unintentional errors or omissions in any information required to be reported to the Company or otherwise relative to this Insured will prejudice the Insured's right of recovery but will be reported to the Company as soon as practicable when discovered.

H. ESCALATION CLAUSE:

In the event the **TOTAL CONTRACT VALUE*** reported for the **INSURED PROJECT*** increases during the policy period, the total project hard cost limit will automatically increase to reflect the change concurrently subject to a maximum of 5% of the original limit shown unless otherwise endorsed.

This extension of coverage does not apply to and shall not modify, amend or alter any other coverage extension or delay in opening coverage insured by the policy and such extension(s) of coverage and delay in opening coverage is expressly excluded.

I. EXPEDITING EXPENSE:

In the event of a covered **LOSS*** occurring during the policy period, the Company will pay for the reasonable and necessary costs incurred to make temporary repairs and to expedite the permanent repair or replacement of the **PROPERTY INSURED*** which is damaged by a peril not otherwise excluded, including additional wages for overtime, night **WORK***, and **WORK*** on public holidays and the extra costs of express freight or other rapid means of transportation.

J. EXTRA EXPENSE:

In the event of a covered **LOSS*** occurring during the policy period, the Company will pay the extra expense incurred as a result of **LOSS*** to the **INSURED PROJECT*** hereunder.

Extra expense means the reasonable and necessary excess costs incurred during the period of restoration and repair that are over and above the total costs that would normally have been incurred during the same period of time had no **LOSS*** occurred. Extra expense shall include, but not be limited to, equipment rental, emergency expenses, temporary use of property, demobilization and remobilization of equipment and facilities, and expenses necessarily incurred to reduce loss excluding, however, any Additional Interest Expense, Debt Service, Business Interruption, Loss of Income, Loss or Earnings, Loss of Rents or Delay in Completion and/or Acceleration Expense.

Any costs incurred hereunder shall be subject to the deductible applicable to the cause of **LOSS*** that necessitates such costs. In the event that the amount of **LOSS*** to **PROPERTY INSURED*** as a result of a covered **LOSS*** is less than the applicable deductible stated elsewhere in this policy, the Company shall not accept a claim for nor be liable for excess costs as covered herein.

K. FIRE FIGHTING CHARGES AND EXTINGUISHING EXPENSES:

In the event of a covered **LOSS*** occurring during the policy period, the Company will pay the following reasonable and necessary expenses:

(1) Fire brigade charges and other extinguishing expenses for which the Named Insured may be assessed;

(2) **LOSS*** of fire extinguishing materials expended in fighting fire, including the **LOSS*** of similar material which may be brought on the project location for the purpose of extinguishing a fire already in progress at the time such materials are ordered and delivered, but liability shall not exceed the combined value of such extinguishing materials which are on the premises, or on adjacent premises, if such materials are jointly owned at the time of **LOSS***.

L. HOT TESTING:

Which means any startup, commissioning or other forms of testing, making use of any feedstock or similar media including operational or performance tests.

When a specific premium, rate or acknowledgement of coverage are entered for hot testing in Paragraph 12 of the Declarations and a testing period has been identified in Paragraph 5 of the Declarations, this policy is extended to cover **LOSS*** to the **PROPERTY INSURED*** which is caused by or results from hot testing.

At no time shall the supervisory and safety systems be deliberately or knowingly circumvented or disabled during the conduct of testing. Should any supervisory and safety systems be circumvented or disabled, coverage for hot testing shall be excluded. However, when it is standard accepted industry practice and/or manufacturer's specification that such circumvention or disabling of supervisory and safety systems is necessary for the conduct of individual activities within the conduct of testing, provided that such circumvention does not extend beyond said individual activities, then such circumvention or disabling shall not exclude coverage. All instrumentation must be installed and activated prior to the conduct of any testing in order for this coverage to apply.

Testing Period: As respects hot testing, the testing period shall mean and be limited to that period beginning with the introduction into the **PROPERTY INSURED*** of feedstock or similar media for processing and handling or the commencement of supply to a system and continuously thereafter whether or not such testing, commissioning or startup is continuous or intermittent and terminating on the expiry of the period of time as provided in Paragraph 5 of the Declarations.

M. MOLD REMEDIATION EXPENSE:

Notwithstanding the exclusion in the policy for **LOSS*** due to **MOLD***, **FUNGUS***, mildew and **SPORES***, in the event of a covered **LOSS*** occurring during the policy period, this policy is extended to cover **MOLD***, **FUNGUS***, mildew and **SPORES*** remediation expenses incurred by the Insured, resulting from or caused by a covered **LOSS***, which results in **LOSS*** to **PROPERTY INSURED***, made necessary by insured physical damage to an **INSURED PROJECT*** or **PROPERTY INSURED*** as provided under the policy. This extension of coverage only applies to the portion of an **INSURED PROJECT*** or **PROPERTY INSURED*** which directly sustained the covered **LOSS***.

MOLD* remediation expense means the following reasonable and necessary costs not otherwise excluded under the policy:

(1) Testing the indoor air quality for **MOLD***, **FUNGUS***, mildew and **SPORES***;
(2) Testing the surfaces and materials of the **INSURED PROJECT***, **PROPERTY INSURED*** or contents for **MOLD***, **FUNGUS***, mildew and **SPORES***;
(3) Developing a **MOLD***, **FUNGUS***, mildew and **SPORES*** remediation plan; and
(4) Implementing a **MOLD***, **FUNGUS***, mildew and **SPORES*** remediation plan including the cleanup, removal, containment, treatment or disposal of **MOLD***, **FUNGUS***, mildew and **SPORES***.

MOLD* remediation shall also mean the following reasonable and necessary costs, including increased cost, not otherwise excluded:

(a) Removing debris solely due to **MOLD***, **FUNGUS***, mildew and **SPORES***; and
(b) Repairing and replacing the **INSURED PROJECT*** or **PROPERTY INSURED*** damaged.

MOLD* remediation expense does not apply beyond the provisions as provided herein including any other consequential loss or damage as a result of **MOLD***,, **FUNGUS***, mildew and **SPORES***.

Any costs incurred hereunder shall be subject to the deductible applicable to the cause of loss that necessitates such costs.

N. OCCUPANCY or COMMERCIAL SERVICE*:

If an occupancy period has been identified in Paragraph 5 of the Declarations, this policy is extended to permit **OCCUPANCY or COMMERCIAL SERVICE*** insured hereunder being a part of an **INSURED PROJECT*** but prior to final acceptance by the Owner and coverage shall not be reduced due to such partial **OCCUPANCY or COMMERCIAL SERVICE*** except as provided herein. In order for this extension of coverage to apply, all **FIRE PROTECTION SYSTEMS*** and security systems within the occupied/operational space shall be in service and fully operational prior to and during any such **OCCUPANCY or COMMERCIAL SERVICE***. It is a condition hereof that the Insured, upon such knowledge, shall report any increase in hazard beyond that provided for in the policy.

O. OFFSITE TEMPORARY STORAGE AND/OR OFFSITE FABRICATION:

This policy is extended to cover **LOSS*** occurring during the policy period to property to be used in or incidental to completion of an **INSURED PROJECT***, while in temporary storage anywhere within the **COVERAGE TERRITORY*** but excluding such property while in the course of manufacturing or processing at the manufacturer's or supplier's site or while in transit, except as provided in the transit extension of coverage.

P. ORDINANCE OR LAW/ DEMOLITION AND INCREASED COST OF CONSTRUCTION:

If the repair of **LOSS*** to **PROPERTY INSURED***caused by an insured peril becomes subject to the enforcement of any ordinance or law that is in force at the time of **LOSS*** and that:

(1) Requires the demolition of parts of the undamaged **PROPERTY INSURED***; or

(2) Regulates the construction or repair of damaged **PROPERTY INSURED***;

then the Company will pay for:

(a) The cost of demolishing the undamaged **PROPERTY INSURED*** and clearing the site of debris from such demolition; and

(b) The value of such undamaged part of the **PROPERTY INSURED*** which must be demolished; and

(c) The increased cost of repair and/or reconstruction of the damaged and undamaged **PROPERTY INSURED*** on the same site and limited to the minimum requirements of such ordinance or law regulating the repair or reconstruction of the damaged **PROPERTY INSURED*** on the same site. However, the Company will not pay for any increased cost of repair or reconstruction unless the damaged **PROPERTY INSURED*** is actually rebuilt or replaced.

The Company will not pay the following costs:

(i) Cost of demolition or increased cost of repair or reconstruction, debris removal, or other consequential loss caused by the enforcement of any ordinance or law regulating asbestos or other hazardous material;

(ii) Cost of any governmental direction or request declaring that asbestos or other hazardous material present in, part of or utilized on any damaged or undamaged portion of **PROPERTY INSURED*** that can no longer be used for the purpose for which it was intended or installed and must be removed, modified or abated;

(iii) Cost of demolition or increased cost of repair or reconstruction, debris removal, or other consequential loss caused by the enforcement of any ordinance or law regulating **CONTAMINANTS OR POLLUTANTS***; or

(iv) Cost of compliance with the enforcement of any ordinance or law which the Named Insured or owner would have otherwise been required to comply by nature of such ordinance or law in the absence of any covered **LOSS***.

Q. PLANS, BLUEPRINTS, DRAWINGS, ELECTRONIC DATA*, RENDERINGS, SPECIFICATIONS OR OTHER CONTRACT DOCUMENTS & MODELS:

This policy is extended to cover **LOSS*** occurring during the policy period to plans, blueprints, drawings, **ELECTRONIC DATA***, renderings, specifications or other contract documents (whether paper or electronic media format) and models while at the location of the **INSURED PROJECT***.

R. POLLUTION & CONTAMINATION CLEAN UP & DECONTAMINATION:

In the event of **LOSS*** occurring during the policy period, the Company will pay the cost of cleanup or decontamination as a result of sudden and unforeseen **LOSS*** caused by **CONTAMINANTS OR POLLUTANTS*** on an **INSURED PROJECT*** site at time of **OCCURRENCE*** but restricted to the **INSURED PROJECT*** site; demolition, or removal of any **PROPERTY INSURED*** to comply with the minimum standards of any regulation, ordinance or law which requires the demolition, repair, or construction of buildings or structures subsequent to and necessitated by a covered **LOSS*** provided that such regulation, ordinance or law is in force at the time of **LOSS***. No additional costs of reconstruction or additional costs of repair by reason of any regulation, ordinance, or law are included hereunder. The foregoing shall not invalidate any other provisions of the policy or endorsements attached to the policy.

Any costs incurred hereunder shall be subject to the deductible applicable to the cause of **LOSS*** that necessitates such costs.

S. PRESERVATION OF PROPERTY: Limit – $25,000

If it is necessary to remove or protect **PROPERTY INSURED*** from the **INSURED PROJECT*** site or off-site storage to protect it from a covered **LOSS***, the Company will pay the costs incurred by the Named Insured to protect or remove the **PROPERTY INSURED*** including moving and storage.

T. REWARD: Limit – $25,000

At the Company's option, the Named Insured may be reimbursed for rewards paid, other than to the Named Insured, or any of the Named Insured's partners, members, managers or officers, for information leading to the conviction of any one or more persons responsible for **LOSS*** covered under this Policy. The Company will be the sole judge as to the payment and amount of the reimbursement.

U. SEWER BACKUP: Limit – 1% of the total project value up to $500,000

Water or waterborne material that backs up, overflows or is otherwise discharged through a sewer or drain, sump or septic tank; or water or waterborne material below the surface of the ground, including but not limited to water or waterborne material that exerts pressure on or flows, seeps, or leaks through or into any **BASEMENT*** or below ground portion of the **INSURED PROJECT***.

V. TRANSIT:

This policy is extended to include transit coverage for **LOSS*** occurring during the policy period to property to be used in or incidental to completion of the **INSURED PROJECT*** from the commencement of loading at the original point of shipment anywhere within the **COVERAGE TERRITORY*,** until completion of unloading at a location of the **INSURED PROJECT***, including shipments on inland or coastal waters but excluding ocean marine shipments.

The Insured agrees to keep records of all shipments covered hereunder and make them available to the Company upon request.

This coverage shall be void if the Insured enters into any special agreement with carriers, releasing them from their common law or statutory liability or agreeing that this insurance shall in any way inure to the benefit of such carriers; however, the Insured may, without prejudice to this coverage, accept such bills of lading, receipts, or contracts of transportation as are ordinarily issued by carriers containing a limitation as to the value of property insured.

W. TREES, SHRUBS, PLANTINGS AND LANDSCAPING:

This policy is extended to cover **LOSS*** occurring during the policy period to trees, plantings, shrubs and landscaping materials which are part of and while located at the **INSURED PROJECT***.

PART B – EXCLUSIONS AND LIMITATIONS

1. EXCLUSIONS:

This policy shall not pay for **LOSS***, costs, expenses or fees caused directly or indirectly and/or contributed to, in whole or in part, by any of the following excluded perils except as specifically allowed as outlined in any section below:

A. Consequential loss, damage or expense of any kind or description including but not limited to loss of market or delay, liquidated damages, performance penalties, penalties for non-completion, delay in completion, or non-compliance with contract conditions, whether caused by a peril insured or otherwise, however the foregoing shall not exclude Delay In Completion Coverage when it is endorsed to this policy.

B. Cost of making good faulty or defective workmanship or material, unless **LOSS*** by a peril not otherwise excluded ensues and then this policy will cover for such ensuing physical loss or damage only.

C. Cost of making good faulty, defects, errors, deficiencies or omissions in design, plans or specifications, unless **LOSS*** by an insured peril ensues and then this policy will cover for such ensuing **LOSS*** or damage only.

D. Wear and tear, gradual deterioration, marring or scratching, inherent vice, latent defect, corrosion, rust, dampness or dryness of the atmosphere, unless **LOSS*** by an insured peril ensues and then this policy will cover for such ensuing **LOSS*** or damage only.

E. **(1)** War, hostile or warlike action in time of peace or war, whether or not declared, including action in hindering, combating or defending against an actual, impending or expected attack:

- **(a)** By government or sovereign power (de jure or de facto) or by any authority maintaining or using military, naval or air forces; or
- **(b)** By military, naval or air forces; or
- **(c)** By an agent of any such government, power, authority or force.

(2) Any weapon of war employing atomic fission or radioactive force whether in time of peace or war, whether or not its discharge was accidental.

(3) Insurrection, rebellion, revolution, civil war, civil commotion, civil unrest, usurped power, acts of foreign enemies, or action taken by government authority in hindering, combating, or defending against such an **OCCURRENCE***, seizure or destruction.

(4) Hijacking or any unlawful seizure or wrongful exercise or control of any mode of transportation, including but not limited to aircraft, watercraft, truck(s), train(s) or automobile(s), including any attempted seizure of control, made by any person or persons.

F. Nuclear reaction, nuclear radiation or radioactive contamination however such may have been caused; nevertheless, if a fire arises directly or indirectly any of the foregoing, any loss or damage arising directly from that fire shall (subject to the provisions of this policy) be covered, excluding however all loss or damage caused by nuclear reaction, nuclear radiation or radioactive contamination arising directly or indirectly from that fire.

G. Mysterious disappearance or when revealed by inventory shortage.

H. Dishonest or criminal act (including theft) by you, any of your partners, members, officers, managers, employees (including temporary employees and leased workers), directors, trustees or authorized representatives, whether acting alone or in collusion with each other or with any other party; or theft by any person to whom you entrust the property for any purpose, whether active along or in collusion with any other part. This exclusion applies whether or not an act occurs during your normal hours of operation but does not apply to acts of destruction by your employees (including temporary employees and leased workers) or authorized representatives.

I. **LOSS***, costs, expenses, fines or penalties incurred or sustained by or imposed on the Insured at the order of any government agency, court or other authority arising from any cause whatsoever beyond the demolition of any damaged portion of the **INSURED PROJECT*** no longer useful for its intended purpose.

J. Actual, alleged or threatened release, discharge, escape or dispersal of **CONTAMINANTS OR POLLUTANTS***, all whether direct or indirect, proximate or remote or in whole or in part caused by, contributed to or aggravated by any **LOSS*** covered by this policy except as provided under the pollution & contamination cleanup & decontamination extension of coverage if provided on the Declarations.

Nevertheless, if fire is not excluded from this policy and a fire arises directly or indirectly from actual release, discharge, escape or dispersal of **CONTAMINANTS OR POLLUTANTS***, any **LOSS*** covered under this policy arising directly from that fire is insured, subject to the provisions of this policy.

This exclusion shall not apply when **LOSS*** is directly caused by fire, lightning, aircraft impact, explosion, riot, civil commotion, smoke, vehicle impact, **WINDSTORM***, vandalism or malicious mischief, leakage or accidental discharge from automatic **FIRE PROTECTION SYSTEMS***.

K. This policy does not cover:

(1) Asbestos material removal;

(2) Demolition or increased cost of reconstruction, repair, debris removal or loss of use necessitated by the enforcement of any law or ordinance regulating asbestos material;

(3) Any governmental order or direction declaring that asbestos material which is present in or part of or utilized on any portion of the **INSURED PROJECT*** must be removed or modified.

L. Loss or damage covered under any written or implied guarantee or warranty by any manufacturer or supplier, but only to the extent of recovery from such written or implied guarantee or warranty.

M. Subsidence, sinkhole, settling, cracking, expansion, contraction or shrinkage of walls, floors, ceilings, buildings, foundations, patios, roofs, walkways, driveways or pavements.

N. Cessation of the **WORK***, whether total or partial, unless such cessation has been directly occasioned by **LOSS*** covered under the policy. Cessation of the **WORK***, as used herein, shall not mean any period of time during which operations would not normally have been conducted such as Saturdays, Sundays or Holidays, nor shall it mean seasonal inactivity planned in advance or labor actions beyond the Insured's control, provided the location of the **INSURED PROJECT*** is maintained and protected against **LOSS*** during such inactivity.

O. Freeze, drought, hail, weight of ice or snow, but only as respects **EXTENSION OF COVERAGE - Trees, Plants, Shrubs and Landscaping**.

P. Nesting or infestation, disease, or any damage caused by insects, vermin, rodents or animals.

Q. Erosion of graded or planted finish or rough grades which results from normally expected or predictable precipitation and **SURFACE WATER*** runoff.

R. As respects to the coverage extension for **PLANS, BLUEPRINTS, DRAWINGS, RENDERINGS, SPECIFICATIONS OR OTHER CONTRACT DOCUMENTS AND MODELS** - electrical or magnetic injury to or errors and omissions in creating, processing or copying electronic records, however caused.

S. **MOLD***, mildew, **FUNGUS***, **SPORES*** or other micro-organism of any type, nature, or description, including but not limited to any substance whose presence poses an actual or potential threat to human health. This exclusion applies regardless of whether there is (i) any **LOSS*** to **PROPERTY INSURED***; (ii) any insured peril or cause, whether or not contributing concurrently or in any sequence; (iii) any loss of use, occupancy, or functionality; or (iv) any action required, including but not limited to repair, replacement, removal, cleanup, abatement, disposal, relocation, or steps taken to address medical or legal concerns.

T. **LOSS*** to any program, software or operating system, programming instruction or data arising out of or resulting from any failure, malfunction, deficiency, deletion, fault, **COMPUTER VIRUS*** or corruption, including but not limited to, **LOSS*** resulting from any authorized or unauthorized access in, of or to any computer, communication system, file server, networking equipment, computer system, computer hardware, data processing equipment, computer memory, microchip, microprocessor (computer chip), integrated circuit or similar device in computer equipment, any program, computer software or operating systems, programming instructions or data.

To the extent coverage for equipment, hardware, media or device is provided in the policy, the following exclusion does not apply:

(1) If any of the matters described above results solely from direct physical loss of or direct physical damage to the equipment, hardware, media or device on which the program, software or operating system, programming instructions, or data are transported, processed or contained;

(2) To **LOSS*** to tangible **PROPERTY INSURED*** that results from any of the matters described above but limited to the perils of fire and explosion only.

For the purposes of this exclusion, program, software or operating system, programming instruction and data are not tangible property insured.

U. The actual or threatened malicious use of pathogenic or poisonous biological or chemical materials regardless of any other cause or event contributing concurrently or in any other sequence thereto.

V. **LOSS*** to property stored in the open arising from, contributed to, or resulting from rain, snow, sleet or ice, all whether wind driven or not. This exclusion does not apply to property while located within the building or structure.

W. Voluntary parting with any property by you or anyone else to whom you have entrusted the property if induced to do so by any fraudulent scheme, trick, device or false pretense.

X. **LOSS***, claim, cost, expense or other sum, directly or indirectly arising out of, attributable to, or occurring concurrently or in any sequence with a **COMMUNICABLE DISEASE*** or the fear or threat (whether actual or perceived) of a **COMMUNICABLE DISEASE***.

For the purposes of this exclusion, **LOSS***, claim, cost, expense or other sum, includes, but is not limited to, any cost to clean-up, detoxify, remove, monitor or test for:

(1) A **COMMUNICABLE DISEASE***, or

(2) Any property insured hereunder that is affected by such **COMMUNICABLE DISEASE***.

2. PROPERTY EXCLUDED:

This policy excludes:

A. Land and land values and the value of cut fill and backfill materials existing at the project site prior to project commencement; however, to the extent included in the contract bid documents and declared for premium purposes, the value of fill and backfill materials purchased for use in the completion of the project is not excluded. Notwithstanding the foregoing, labor and material charges incurred to move, remove, place or otherwise handle cut, fill and backfill materials, whether insured or uninsured in the foregoing, are covered to the extent such charges are included in the contract bid documents and declared for premium purposes.

B. Contractor's tools, machinery, plant and equipment, including spare parts and accessories, whether owned, loaned, hired or leased, and property of a similar nature not destined to become a permanent part of the completed **INSURED PROJECT*** unless the value of the same is reported and additional premium is paid at rates and terms to be agreed.

C. Vehicles or equipment licensed for highway use, rolling stock, aircraft or watercraft.

D. Water, animals, standing timber and growing crops. This exclusion does apply to loss of water contained in any process equipment, tank or pipe.

E. Accounts, bills, currency, food stamps or other evidences of debt, money, bonds, notes or securities, precious alloys or metals, or precious and semi-precious stones or other property of similar nature.

F. Existing property at the location of the **INSURED PROJECT*** unless separately declared to the Company in advance and specifically endorsed to the Builders Risk policy.

G. Property located at other than the location of **INSURED PROJECT*** except as covered under the Transit or Offsite Temporary Storage/Offsite Fabrication Extensions of Coverage.

H. Prototype, developmental or used machinery and equipment but only as to damage while undergoing any form of testing, commissioning or startup unless specifically endorsed to the policy.

I. Transmission and distribution lines outside of the **INSURED PROJECT***.

J. **LOSS*** to **PROPERTY INSURED*** while covered by Ocean Marine Insurance or while waterborne in the course of ocean shipment.

K. Any property while located at any site which stores, processes or otherwise handles or makes use of radioactive materials unless reported to and accepted by the Company. The foregoing shall not apply to locations or property making use of radioactive isotopes contained within equipment used for diagnostic or testing purposes.

L. Contraband or property in the course of illegal transportation or trade.

M. Underground caverns, mines or mine shafts or any property contained therein.

PART C - DEFINITIONS

Wherever in this policy words or phrases appear in capitalized bold face type followed by an Asterisk, the following definitions will be applied in the interpretation of such words or phrases:

1. **BASEMENT:**
   Shall be defined as any area of a structure having its bottom surface, whether floored or not, below ground level on any side of such structure.

2. **COMMUNICABLE DISEASE:**
   Communicable Disease means any disease which can be transmitted by means of any substance or agent from any organism to another organism where:
   - **A.** The substance or agent includes, but is not limited to, a virus, bacterium, parasite or other organism or any variation thereof, whether deemed living or not, and
   - **B.** The method of transmission, whether direct or indirect, includes but is not limited to, airborne transmission, bodily fluid transmission, transmission from or to any surface or object, solid, liquid or gas or between organisms, and
   - **C.** The disease, substance or agent can cause or threaten damage to human health or human welfare or can cause or threaten damage to, deterioration of, loss of value of, marketability of or loss of use of property insured hereunder.

3. **COMPUTER VIRUS:**
   Any software, data or code that affects the operation or functionality of any computer, communication system, file server, networking equipment, computer system, computer hardware, data processing equipment, computer memory, microchip, microprocessor (computer chip), integrated circuit or similar device in computer equipment, program, computer software or operating systems, programming instructions or data including, but not limited to, any destructive program, computer code, computer virus, worm, logic bomb, denial of service attack, smurf attack, vandalism, Trojan Horse or any other data introduced into any electronic system causing deletion, destruction, degradation, corruption, malfunction or compromise to data or electronic business systems.

4. **CONTAMINANTS OR POLLUTANTS:**
   Contaminants and Pollutants means any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals and waste, which after its release can cause or threaten damage to human health or human welfare or causes or threatens damage, deterioration, loss of value, marketability or loss of use to property insured hereunder, including, but not limited to, bacteria, fungi, virus, or hazardous substances as listed in the Federal Water, Pollution Control Act , Clean Air Act, Resource Conservation and Recovery Act of 1976, and Toxic Substances Control Act or as designated by the U. S. Environmental Protection Agency. Waste includes materials to be recycled, reconditioned or reclaimed.

5. **COVERAGE TERRITORY:**
   While located at the location of the **INSURED PROJECT*** and while in transit within and / or offsite storage within the **fifty (50)** states comprising the United States of America, and within the District of Columbia including up to **three (3**) miles within the territorial coastal waters of any of the foregoing.

6. **EARTH MOVEMENT:**
   Shall mean all earthquake, landslide, mudslide, mudflow, rock fall, tsunami, volcanic action, volcanic eruption, sinkhole collapse, subsidence or rock fall or other Earth Movement whether man-made or caused by **natural** phenomena.

   If Earth Movement is excluded, this policy will cover the resulting damage if caused by the covered peril of sprinkler leakage.

7. ELECTRONIC DATA:

Electronic data means information, facts or computer programs stored as or on, created or used on, or transmitted to or from computer software (including systems and applications software), on hard or floppy disks, CD-ROMs, tapes, drives, cells, data processing devices or any other repositories of computer software which are used with electronically controlled equipment. The term computer programs, referred to in the foregoing description of electronic data, means a set of related electronic instructions which direct the operations and functions of a computer or device connected to it, which enable the computer or device to receive, process, store retrieve or send data.

8. FIRE PROTECTION SYSTEMS:

Tanks, water mains, hydrants, or valves, and any other equipment whether used solely for fire protection or jointly for fire protection and for other purposes but excluding:

A. Branch piping from a joint system where such branches are used entirely for purposes other than fire protection.

B. Any underground water mains or appurtenances located outside of the **INSURED PROJECT*** and forming part of the public water distributing system.

C. Any pond or reservoir in which the water is impounded by a dam.

9. FLOOD:

A. A general and temporary condition of complete inundation of normally dry land areas, including dewatered areas, from:

(1) The overflow of inland or tidal waters;

(2) The unusual and rapid accumulation or runoff of **SURFACE WATER***;

(3) Mudslides (i.e. mudflows) which are caused by flooding as defined in subparagraph **(b)** above and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

B. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding the cyclical levels which result in flooding as defined in a (1) above. All whether driven by wind or not.

C. **FLOOD*** or storm surge as a result of a **NAMED WINDSTORM*** is excluded from this coverage.

The term **FLOOD*** shall not include Sewer Back up.

10. FUNGUS:

Fungus includes, but is not limited to, any of the plants or organisms belonging to the major group fungi, lacking chlorophyll, and including **MOLD***, rusts, mildews, smuts and mushrooms.

11. INSURED PROJECT:

The **WORK*** which the Insured is contractually obligated to perform in accordance with the contract documents being more fully described and located as set forth in the Declarations.

12. LOSS:

Means accidental, direct physical loss or damage to the **PROPERTY INSURED***. **LOSS*** does not mean any indirect or ensuing loss that is not a direct result of actual physical damage to the **PROPERTY INSURED***, including but not limited to the presence of disease particles of any size, restrictions to access the worksite whether imposed by any governmental entity or any other restrictions from any source that would affect the ability to access the site or continue **WORK*** at the site.

13. MOLD:

Mold(s) includes, but is not limited to, any superficial growth produced on damp or decaying organic matter or on living organisms, and fungi that produce mold(s).

14. NAMED WINDSTORM:

A storm that has been declared and or identified by the National Oceanic and Atmospheric Administration's (NOAA) National Hurricane Center, National Weather Service or similar governing body to be a Hurricane, Typhoon, Tropical Cyclone, Tropical Storm, or a Tropical Depression and includes storm surge, being defined as an offshore rise of water associated with a low pressure weather system, typically a tropical cyclone.

15. OCCURRENCE:

With the exception of the perils of **EARTH MOVEMENT*, FLOOD***, **NAMED WINDSTORM*, WINDSTORM***, riot, riot attending a strike, civil commotion, civil unrest, and vandalism and malicious mischief, **OCCURRENCE*** means an accident, incident, or a series of accidents or incidents arising immediately out of a single event or originating cause and includes all resultant or concomitant losses wherever located.

In respect of the perils of **EARTH MOVEMENT*, FLOOD***, **NAMED WINDSTORM*, WINDSTORM***, riot, riot attending a strike, civil commotion, civil unrest, and vandalism and malicious mischief, **OCCURRENCE*** shall mean all **LOSS*** arising during a continuous period of **one hundred sixty-eight (168)** hours during the term of this policy insofar as the limit of liability, sublimit of liability, aggregate limit of liability and the deductible provisions of the policy are concerned. The Insured may elect the moment when the **one hundred sixty-eight (168)** hour period begins, but no two such periods shall overlap. Such **EARTH MOVEMENT*, FLOOD***, **NAMED WINDSTORM*, WINDSTORM***, riot, riot attending a strike, civil commotion, civil unrest, and vandalism and malicious mischief shall be deemed to be a single **OCCURRENCE*** within the meaning of this policy. The Company shall not be liable for any such **LOSS*** occurring before the effective date and time or occurring after the expiration date and time of this Policy; however, the Company will be liable for any **LOSS*** occurring for a period, of up to **seventy-two (72)** consecutive hours after the expiration of this policy provided that the **OCCURRENCE*** takes place prior to the date and time of the expiration of this policy.

16. OCCUPANCY or COMMERCIAL SERVICE:

Means when the **INSURED PROJECT*** or any portion thereof has been put to its intended use, but only as respects to such portion or portions being put to use. The orientation or training of building management staff, the training of plant engineering and maintenance personnel, the establishment of a sales or rental office and completion of tenant fit out **WORK*** shall not be considered **OCCUPANCY or COMMERCIAL SERVICE*** on their own.

17. PROPERTY INSURED:

A. Permanent Works - All materials, supplies, equipment, machinery, and other property of a similar nature, being property of the Insured or of others for which the Insured may be contractually responsible, the value of which has been included in the estimated value of the **INSURED PROJECT*** in the Declarations, all when used or to be used in or incidental to the demolition of existing structures, site preparation, fabrication or assembly, installation or erection or the construction of or alteration, renovation, rehabilitation of the **INSURED PROJECT***.

B. Temporary Works - All scaffolding, formwork, fences, shoring, hoarding, falsework and temporary buildings all incidental to the project and the value of which has been included in the estimated value of the **INSURED PROJECT*** in the Declarations.

18. SPORES:

Any dormant or reproductive body produced by or arising or emanating out of any **FUNGUS***, **MOLD***, mildew, plants, organisms or microorganisms.

19. SURFACE WATER:

As used hereunder, shall mean seepage, leakage or influx of water (immediately derived from natural sources) through sidewalks, driveways, foundations, walls, **BASEMENTS*** or other floors, or through doors, windows or any other openings in such sidewalks, foundations, walls or floors.

20. TIER 1 & 2 COUNTIES AND PARISHES (in application of NAMED WINDSTORM*):

Tier 1 Counties:

Alabama	Baldwin and Mobile
Connecticut	Fairfield, Hartford, Litchfield, Middlesex, New Haven, New London and Tolland
Delaware	Sussex
Florida	All Counties
Georgia	Bryan, Camden, Chatham, Glynn, Liberty, and McIntosh
Hawaii	All Counties
Louisiana	Acadia, Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, Iberia, Iberville, Jefferson, Jefferson Davis, Lafayette, LaFourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. Helena, St. James, St. John the Baptist, St. Martin, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Vermilion, and Washington
Maine	Androscoggin, Aroostook, Cumberland, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Sagadahoc, Somerset, Waldo, Washington, and York
Maryland	Worcester
Massachusetts	Barnstable, Bristol, Dukes, Essex, Nantucket, Norfolk, Plymouth, and Suffolk
Mississippi	Hancock, Harrison, and Jackson
New Hampshire	Belknap, Carroll, Hillsborough, Merrimack, Rockingham and Strafford
New Jersey	Atlantic, Cape May, Monmouth, and Ocean
New York	Kings, Nassau, Queens, Richmond, and Suffolk
North Carolina	Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Currituck, Dare, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington
Rhode Island	Newport and Washington
South Carolina	Beaufort, Charleston, Colleton, Georgetown, Horry, and Jasper
Texas	Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio, and Willacy
Virginia	Accomack, Alexandria, Arlington, Caroline, Charles City, Chesapeake, Chesterfield, Colonial Heights, Culpeper, Dinwiddie, Essex, Fairfax, Fairfax City, Falls Church, Fauquier, Franklin, Fredericksburg, Gloucester, Hampton, Hanover, Henrico, Hopewell, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Loudoun, Manassas City, Manassas Park City, Mathews, Middlesex, New Kent, Newport News, Norfolk, Northampton, Northumberland, Petersburg, Poquoson City, Portsmouth, Prince George, Prince William, Richmond, Richmond City, Southampton, Spotsylvania, Stafford, Suffolk, Surry, Sussex, Virginia Beach, Westmoreland, Williamsburg and York

Tier 2 Counties:

Alabama	Clarke, Covington, Escambia, Geneva, Monroe, and Washington
Delaware	Kent
District of Columbia	All
Georgia	Brantley, Charlton, Effingham, Long, and Wayne
Maryland	Anne Arundel, Baltimore, Baltimore City, Calvert, Caroline, Carroll, Cecil, Charles, Dorchester, Harford, Howard, Kent, Montgomery, Prince Georges, Queen Annes, St Mary's, Somerset, Talbot, and Wicomico
Massachusetts	Middlesex
Mississippi	George, Pearl River, and Stone
New Jersey	Burlington, Cumberland, Essex, Hudson, Middlesex, and Union
New York	Bronx, New York, and Westchester
North Carolina	Bladen, Columbus, Craven, Duplin, Gates, Hudson, Middlesex, and Union
Pennsylvania	Bucks, Chester, Delaware, Lancaster, Montgomery, Philadelphia, and York
Rhode Island	Bristol, Kent, Newport, Providence, and Washington
South Carolina	Berkeley, Dillon, Dorchester, Florence, Hampton, Marion, and Williamsburg
Texas	Bee, Brooks, Fort Bend, Goliad, Hardin, Hidalgo, Jackson, Jim Wells, Liberty, Live Oak, Orange, Victoria, and Wharton

21. TOTAL CONTRACT VALUE or TOTAL COMPLETED VALUE:

The total value of all **PROPERTY INSURED*** including, but not limited to, all wages, expenses, materials, supplies, equipment, change orders plus if declared, contractor's profit and overhead, existing structures (when coverage is included by endorsement) and such other charges, all whether provided by the owner, contractors or others, which will become a part of or will be expended in the project plus the value, if any, of soft costs, rental income or gross earnings to be insured under the Delay In Completion Endorsement when applicable.

22. WATER DAMAGE:

Means **LOSS*** as covered by this policy which is a result of leakage of fluids, liquids and gases caused by an insured peril other than the peril of **FLOOD***.

23. WINDSTORM:

Shall mean any naturally occurring movement other than **NAMED WINDSTORM*** including but not limited to wind, windborne debris, tornados and hail.

24. WORK:

Shall mean the actual physical construction, installation, renovation/repair of a building, structure and or project has commenced and continues without delay.

PART D – GENERAL CONDITIONS

1. ALTERNATIVE DISPUTE RESOLUTION:

If the Company and the Named Insured disagree, after making a good faith effort to reach an agreement on an issue concerning this policy, either party may request that the following procedure be used to settle such disagreement:

A. The Company or the Named Insured may request of the other in writing that the dispute be settled according to an alternative dispute resolution procedure.

B. If the Company and the Named Insured agree to proceed, they will jointly select an alternative dispute resolution technique for resolution of the dispute.

C. If the parties cannot agree on a method to resolve the issue in dispute within **sixty (60)** days of written request, the parties will contact either the Center for Public Resources or the American Arbitration Association and will use their services to select or devise a dispute resolution mechanism.

D. Alternative dispute resolution procedures that may be used include, but are not limited to, mediation, binding arbitration and mini-trials, except where prohibited by applicable law or regulation.

E. All expenses of the alternative dispute resolution procedure will be shared equally by both parties.

F. Any decision or award made as a result of the alternative dispute resolution procedure shall always be limited by the Coverage Terms and Conditions, Limits, Sublimits, Aggregate Limits of Liability, and deductibles of this policy.

G. Any statute of limitation that may be applicable to the dispute shall be tolled, with respect to such dispute, from the date that the Company and the Named Insured agree to follow the procedure set forth herein until and including the date that such procedure is concluded.

If the Named Insured so requests, the Company hereby agrees to use the alternative dispute resolution procedure described above to resolve all issues concerning this policy except the following:

(1) Any dispute involving asbestos including **LOSS*** or debris removal expense.

(2) Any dispute involving debris removal expense for **CONTAMINANTS OR POLLUTANTS***.

(3) Any dispute where coverage is denied based on arson or other attempted fraud by the Named Insured.

(4) Any dispute within the scope of and governed by the appraisal clause, below.

2. APPRAISAL:

If the Insured and the Company disagree on the value of the property or the amount of **LOSS***, either may make written demand for an appraisal of the **LOSS***. In this event, each party will select a competent and impartial appraiser within **twenty one (21)** days after receiving a written request from the other. The two appraisers will select an umpire. If they cannot agree upon an umpire within **fifteen (15)** days, either may request the selection by a judge of a court having jurisdiction. The appraisers will then appraise the **LOSS***, stating separately the value of the property and the amount of **LOSS*** to each item. If they fail to agree, they will submit their differences to the umpire. A decision in writing, so itemized, of any two will be binding. Each party will pay its chosen appraiser and bear the other expense of the appraisal and umpire equally. If there is an appraisal, the Company will still retain the right to deny the claim.

3. ASSIGNMENT:

Except in the event of an authorized assignment under the Bankruptcy Act or a change of title by succession, operation of law or death, the Named Insured agrees not to transfer any legal rights or interests in the policy without the Company's written consent.

4. OBSERVANCE OF CONDITIONS:

The due observance and fulfillment of the terms and conditions of this policy by the Insured, insofar as they relate to anything to be done or complied with by them, shall be a condition precedent to any liability of the Company to make payment for **LOSS*** under this policy.

5. BANKRUPTCY OR INSOLVENCY:

Bankruptcy or insolvency of the Insured shall not relieve the Company of any of its obligations under this policy.

6. BRANDS & TRADEMARKS:

In case of **LOSS*** by an insured peril to **PROPERTY INSURED*** bearing a brand, trademark or label, the Company may take all or any part of the property at any agreed or appraised value. If so, the Insured may, at their own expense:

A. Stamp salvage on the property or its container, if the stamp will not physically damage the property; or

B. Remove the brand, trademark or label, if doing so will not physically damage the property. The Insured must re-label the property or its container to comply with the law.

7. CLAIM AGAINST TRANSIT CARRIER AND/OR BAILEE:

No claim for **LOSS*** during transit shall be payable hereunder until the Insured has filed a claim with and made reasonable efforts to secure payment from the transporting carrier and the carrier has denied liability.

8. CONFLICT OF WORDING:

The conditions contained in this coverage form shall supersede those of the printed conditions to which this form is attached, wherever the same may conflict. Where there is a conflict between the coverage form and the printed conditions of this policy, the conditions of the specific section shall prevail.

9. CONTRIBUTING INSURANCE:

Permission is granted for other policies written upon the same terms, exclusions, limitations and conditions as those contained herein. This policy will contribute to the total of each **LOSS*** otherwise payable herein to the extent of the participation of this policy in the total limit of liability as provided by all policies written upon the same terms, exclusions, limitations and conditions as those contained in this policy.

10. DUPLICATE COVERAGE:

No claim for **LOSS*** resulting from **FLOOD*** or **NAMED WINDSTORM*** will result in payment under both coverages.

11. EXCESS INSURANCE:

If notice is provided to the Company, and the Company so approves, permission is granted for the Insured to have excess insurance over the limit of liability set forth in this policy. The existence of such insurance, if any, will not reduce any liability under this policy. Any other insurance that would have provided primary coverage in the absence of this Policy will not be considered excess.

12. IN THE EVENT OF LOSS*:

A. The Insurer must see that the following are done in the event of **LOSS*** to **PROPERTY INSURED***:

(1) Notify the police if a law may have been broken.

(2) Give the Company prompt notice of the **LOSS***. Include a description of the property involved.

(3) As soon as possible, give the Company a description of how, when and where the **LOSS*** occurred. Take all reasonable steps to protect the **PROPERTY INSURED*** from further damage and keep a record of any expenses necessary to protect the **PROPERTY INSURED***, for consideration in the settlement of the claim. This will not increase the Limit of Insurance. However, the Company will not pay for any subsequent **LOSS*** resulting from a cause of loss that is not covered under this policy. Also, if feasible, set the damaged property aside and in the best possible order for examination.

(4) At the Company's request, give the Company complete inventories of the damaged and undamaged property. Include quantities, costs, values, and amount of loss claimed.

(5) As often as may be reasonably required, permit the Company to inspect the property proving the **LOSS*** and examine the Insured's books and records.

(6) Also, permit the Company to take samples of damaged and undamaged property for inspection, testing and analysis, and permit the Company to make copies from all the Insured's books and records.

(7) Send the Company a signed, sworn proof of loss containing the information the Company requests to investigate the claim.

B. The Insured must do the following within **sixty (60)** days after the Company's request and the Company will supply the Insured with the necessary forms:

(1) Cooperate with the Company in the investigation or settlement of the claim.

(a) The Company may examine any insured under oath, while not in the presence of any other insured and at such times as may be reasonably required, about any matter relating to this insurance or the claim, including an insured's books and records. In the event of an examination, an insured's answers must be signed.

(b) After **LOSS*** to **PROPERTY INSURED***, there can be no abandonment of the **PROPERTY INSURED*** without the consent of the Company.

13. INCREASED HAZARD:

If the circumstances in which this insurance was entered into shall be altered or if the risk shall be materially increased, the Insured shall as soon as possible give notice in writing to the Company.

14. INSPECTION & AUDIT:

While this policy is in effect, the Company can, at any reasonable time, inspect the **PROPERTY INSURED*** and operations. However, neither the Company's inspection nor any report thereof can serve as any representation that the **PROPERTY INSURED*** or operations are safe or healthful, or that they comply with any law, rule or regulation.

With respect to an adjustment of a claim books and records will be kept by the Insured in such a manner that the total project cost of the **WORK*** and the exact amount of any **LOSS*** covered by this policy can be accurately determined. The Company may examine and audit the Insured's books and records at any reasonable time during the policy period and within one year after the final termination of the policy, as long as they relate to the subject matter of this policy.

15. MISREPRESENTATION & FRAUD:

This policy shall be void if the Insured has concealed or misrepresented any material fact or circumstances concerning this insurance or the subject thereof, or in case of any fraud, attempted fraud or false swearing by the Insured touching any matter relating to this insurance or the subject thereof, whether before or after a **LOSS***.

16. MORTGAGE HOLDERS:

A. **LOSS*** to the **PROPERTY INSURED*** under this policy will be payable to the mortgagee (or trustee) as named in this policy or on an ACORD Certificate of Insurance issued to confirm coverage under this policy, as their interest may appear, under all present or future mortgages upon the **PROPERTY INSURED*** in which the aforesaid may have an interest as mortgagee (or trustee) in order of precedence of said mortgages and this insurance, as to the interest of the mortgagee (or trustee) only therein, will not be invalidated by any act or neglect of the mortgagor or owner of the **PROPERTY INSURED***, or by any foreclosure or other proceedings or notice of sale relating to the **PROPERTY INSURED***, nor by any change in the title or ownership of the **PROPERTY INSURED***, nor by the occupation of the **INSURED PROJECT*** for purposes more hazardous than are permitted by this policy, provided, that if the mortgagor or owner neglects to pay any premium due under this policy, the mortgagee (or trustee) will, on demand, pay the same.

B. Provided also that the mortgagee (or trustee) will notify the Company of any change in ownership, occupancy or increase in hazard which becomes known to them and, unless permitted by this policy, it will be noted thereon and the mortgagee (or trustee) will, on demand, pay the premium for such increased hazard for the term of the use thereof, otherwise this policy will be null and void.

C. The Company reserves the right to cancel this policy at any time as provided by its terms, but in such case this policy will continue in force for the benefit of the mortgagee (or trustee) for ten (10) days after notice to the mortgagee (or trustee) of such cancellation and will then cease, and the Company will have the right, on like notice, to cancel this agreement.

Whenever the Company will pay the mortgagee (or trustee) any sum for **LOSS*** under this policy and will claim that, as to the mortgagor or owner, no liability therefore existed, the Company will, to the extent of such payment, be thereupon legally subrogated to all rights of the party to whom such payment will be made, under all securities held as collateral to the mortgage debt or may, at its option, pay to the mortgagee (or trustee) the whole principle due or to grow due on the mortgage with interest, and will thereupon receive a full assignment and transfer of the mortgage and of all such other securities; but no subrogation will impair the right of the mortgagee (or trustee) to recover the full amount of said mortgagee's (or trustee's) claim.

17. NO BENEFIT TO BAILEE:

No person or organization, other than an insured, having custody of **PROPERTY INSURED*** will benefit from this policy.

18. OTHER INSURANCE:

Except as stated in **CONTRIBUTING INSURANCE** and **EXCESS INSURANCE** above, if there is other collectible insurance, this policy will cover as excess insurance and will not contribute with such other insurance.

19. PAIR & SET:

A. In the event of **LOSS*** to any insured article or articles which are part of a pair or set, the measure of loss of or damage to such article or articles will be a reasonable and fair proportion of the total value of the pair or set, giving consideration to the importance of said article or articles, but in no event will such **LOSS*** be construed to mean total loss of the pair or set; or

B. In the event of **LOSS*** to any part of **PROPERTY INSURED*** consisting, when complete for use, of several parts, the Company will only be liable for the value of the part lost or damaged.

20. PARTIAL LOSS:

The Company hereby grants permission to repair any partial damage to the **PROPERTY INSURED*** which can be conveniently and advantageously undertaken by the Insured. The Company will reimburse the Insured who has suffered the **LOSS*** for the actual cost of such repairs, subject always to the applicable deductible and limits of liability stated in the Declarations. Nothing in this clause shall be deemed to have waived the requirement that notice of loss be given forthwith to the Company as provided in this policy.

21. PROTECTION OF PROPERTY:

The Insured will take reasonable and necessary steps to protect, recover or save the **PROPERTY INSURED*** and minimize any further or potential **LOSS*** when the **PROPERTY INSURED*** is in imminent danger of sustaining **LOSS*** from:

A. **NAMED WINDSTORM*, WINDSTORM*** or other related perils, but only when the potential for the same to occur has been forecasted by the National Weather Service or similar recognized weather forecast service(s);

B. **FLOOD***, but only when the potential for the same to occur has been forecasted by the National Weather Service or the U.S. Army Corps of Engineers;

C. Fire;

The acts of the Insured or the Company in protecting, recovering or saving the **PROPERTY INSURED*** will not be considered a waiver or an acceptance of abandonment. The Insured and the Company will bear the expense incurred proportionate to their respective interests.

The foregoing shall not serve to increase the Limit of Liability stated in the Declarations and shall be subject to the deductible provisions of the policy.

22. RECOVERY OR SALVAGE:

Any recovery or salvage excluding proceeds from subrogation and other insurance recovered or received after a loss settlement under this policy or any recovery from surety ship, insurance, reinsurance, security or indemnity taken by or for the benefit of the Company will apply as if recovered or received prior to the loss settlement and the **LOSS*** will be readjusted accordingly.

23. REINSTATEMENT:

With the exception of **LOSS*** caused by perils or coverage which is subject to an aggregate limit, any **LOSS*** hereunder will not reduce the amount of this policy.

24. STATUTES:

If any Article(s) herein stated conflict with the laws or statutes of any jurisdiction within which this policy applies, such Article(s) are hereby amended to conform to said laws or statutes.

25. SUBROGATION:

If the Company pays a claim under this policy, it will be subrogated, to the extent of such payment, to all the Insured's rights of recovery from other persons, organizations and entities. The Insured will execute and deliver instruments and papers and do whatever else is necessary to secure such rights.

The Company will have no rights of subrogation against:

A. Any person or entity, which is a Named Insured or an Additional Insured, as referenced in the Policy Declarations;

B. Any other person or entity, which the Insured has waived its rights of subrogation against in writing before the time of **LOSS***;

Notwithstanding the foregoing, it is a condition of this policy that the Company shall be subrogated to all the Insured's or Additional Insured(s)' rights of recovery against:

(1) Any Architect or Engineer, whether named as an Insured or not, for any loss or damage arising out of the performance of professional services in their capacity as such and caused by an error, omission, deficiency or act of the Architect or Engineer, by any person employed by them or by any others for whose acts they are legally liable, and;

(2) Any manufacturer or supplier of machinery, equipment or other property, whether named as an Insured or not, for the cost of making good any loss or damage which said party has agreed to make good under a guarantee or warranty, whether expressed or implied.

The Insured will act in concert with the Company and all other interest concerned in the exercise of such rights of recovery. The Insured will do nothing after a loss to prejudice such rights of subrogation. If any amount is recovered as

a result of such proceedings, the net amount recovered after deducting the costs of recovery, will accrue first to the Company. Any excess of this amount will be remitted to the Insured. If there is no recovery, the interests instituting the proceedings will bear the expense of the proceedings proportionately.

26. SUIT AGAINST THE COMPANY:

In the event of failure of the Company to pay any amount claimed to be due hereunder, the Company, at the request of the Insured, will submit to the jurisdiction of a court of competent jurisdiction within the United States. Nothing in this condition constitutes or should be understood to constitute a waiver of the Company's rights to commence an action in any court of competent jurisdiction in the United States to remove an action to a United States District Court or to seek a transfer of a case to another court as permitted by the laws of the United States or of any state in the United States. It is further agreed that service or process in such suit may be made upon Counsel,

If **INSURED PROJECT*** is located in the state of Rhode Island:
Sherry A. Goldin
10 Weybosset Street
Providence, Rhode Island 02903

If **INSURED PROJECT*** is located in any state other than Rhode Island:
General Counsel
Intact Insurance Specialty Solutions-Legal Department
605 North Highway 169
Suite 800
Plymouth, MN 55441

or his or her representative, and that, in any suit instituted against the Company upon this policy, the Company will abide by the final decision of such court or of any appellate court in the event of an appeal.

Further, pursuant to any statute of any state, territory, or district of the United States, which makes provision therefore, the Company hereby designates the Superintendent, Commissioner or Director of Insurance, other officer specified for that purpose in the statute, or his successor or successors in office as its true and lawful attorney upon whom may be served any lawful process in any action, suit, or proceeding instituted by or on behalf of the Insured or any beneficiary hereunder arising out of this policy of insurance and hereby designates the above named Counsel as the person to whom the said officer is authorized to mail such process or a true copy thereof.

No suit, action or proceeding against the Company or this policy for the recovery of any claim will be sustainable in any court of law or equity unless the Insured will have fully complied with all the requirements of this policy. The Company agrees that any action or proceeding against it for recovery of any **LOSS*** under this policy will not be barred if commenced within **(12) twelve** months after the **OCCURRENCE*** become known to the Insured unless a longer period of time is provided by applicable statute.

28. TITLES OF PARAGRAPHS:

The several titles of the various paragraphs of this form and endorsements attached to this policy are inserted for reference and shall not be deemed in any way to affect the provisions to which they relate.

29. UNDERLYING INSURANCE:

Permission is given for the Insured to purchase insurance on all or any part of the deductible(s) or perils of this policy. The existence of such underlying insurance shall not prejudice or affect any recovery otherwise payable under this policy. If the limits of liability of such other insurance are greater than this Policy’s applicable deductible, this Policy’s insurance will apply only after such other insurance has been exhausted.

30. VALUATION:

At the time and place of **LOSS***, the basis of adjustment of a claim, unless otherwise endorsed herein, shall be as follows:

A. Property Under Construction – Cost to repair or replace the property lost or damaged at the time and place of **LOSS* LOSS*** with material of like kind and quality less betterment including contractor's profit and overhead and including owner's indirect expenses to the extent declared as part of the **TOTAL COMPLETED VALUE***, but in no event to exceed the Limit of Liability; if not so replaced then loss shall be settled on the basis of Actual Cash Value with proper deduction for depreciation;

B. Property Of Others (Including Items Supplied by the Owner) - at owner's cost or other actual cash value, whichever is greater, including the contractor's charges;

C. Temporary Works - Cost to repair or replace the property lost or damaged with material of like kind, quality and condition but in the event not replaced recovery will not exceed Actual Cash Value;

D. Plans, Blueprints, Drawings, Renderings, Specifications or Other Contract Documents and Models – At the cost to reproduce the property with other property of like kind and quality including the cost of gathering or assembling information from back up data if replaced, or if not replaced, at the value of blank material;

E. Trees, Shrubs, Plantings and Landscaping - At cost to replace with property of like kind, quality and size plus the proper proportion of labor expended if such damage occurs after installation.

F. Property In Transit – The invoice cost plus accrued shipping charges less shipper's liability, if any.

striior
INSURANCE SOLUTIONS

ENDORSEMENT

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY. **Endorsement #:** 1

* THIS INFORMATION IS COMPLETED ONLY WHEN THIS ENDORSEMENT IS ISSUED SUBSEQUENT TO PREPARATION OF THE POLICY.

Company Name*:	As Per Schedule of Insurers	**Policy Number:**	CSN0015754
Named Insured*:	Ahrens Enterprises, Inc. dba AHRENS Companies	**Policy Effective Date:**	06/04/2024
Producer*:	AmWINS	**Endt. Effective Date:**	06/04/2024

CHEMICAL, BIOLOGICAL, NUCLEAR AND RADIOACTIVE EXPLOSION, POLLUTION OR CONTAMINATION EXCLUSION CLAUSE

Notwithstanding any provision to the contrary within this Policy or any endorsement thereto, this Policy excludes absolutely any, loss, damage, cost, claim, expense, sum or other obligation of any kind or description directly or indirectly caused by, contributed to, resulting from, or arising out of or in connection with actual, threatened, feared or perceived use of any biological, chemical, radioactive or nuclear agent, material, device or weapon regardless of any other cause or event that contributes concurrently or in any sequence thereto.

The above exclusion also applies to any act of terrorism. For the purpose of this endorsement an act of terrorism means an act, including but not limited to the use of force or violence and/or the threat thereof, of any person or group(s) of persons or property, whether acting alone or on behalf of or in connection with any organization(s) or government(s), committed for political, religious, ideological or similar purposes including the intention to influence any government and/or to put the public, or any section of the public, in fear.

Authorized Representative

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

striior
INSURANCE SOLUTIONS

ENDORSEMENT

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY. **Endorsement #:** 2

* THIS INFORMATION IS COMPLETED ONLY WHEN THIS ENDORSEMENT IS ISSUED SUBSEQUENT TO PREPARATION OF THE POLICY.

Company Name*:	As Per Schedule of Insurers	**Policy Number:**	CSN0015754
Named Insured*:	Ahrens Enterprises, Inc. dba AHRENS Companies	**Policy Effective Date:**	06/04/2024
Producer*:	AmWINS	**Endt. Effective Date:**	06/04/2024

ASBESTOS ENDORSEMENT

A. This Policy only insures asbestos physically incorporated in an insured building or structure, and then only that part of the asbestos which has been physically damaged during the policy period by one of these Listed Cause of Loss:

Fire, explosion, lightning, direct impact of vehicle, aircraft or vessel; riot or civil commotion; vandalism or malicious mischief; and accidental discharge of fire protective equipment.

This coverage is subject to all limitations in the policy to which this endorsement is attached and, in addition, to each of the following specific limitations:

1. The said building or structure must be insured under this policy for damage by that Listed Cause of Loss.
2. The Listed Causes of Loss must be the immediate, sole cause of the damage to the asbestos.
3. The Insured must report to Underwriters the existence and cost of the damage as soon as practicable after the Listed Cause of Loss first damaged the asbestos. However, this policy does not insure any such damage first reported to Underwriters more than 12 (twelve) months after the expiration, or termination, of the policy period.
4. Insurance under this policy in respect of asbestos shall not include any sum relating to:
   a. any faults in the design, manufacture or installation of the asbestos.
   b. asbestos not physically damaged by the Listed Cause of Loss including any governmental or regulatory authority direction or request of whatsoever nature relating to undamaged asbestos.

Except as set forth in the foregoing Section A, this policy excludes absolutely any, loss, damage, cost, claim, expense, sum or other obligation of any kind or description directly or indirectly caused by, contributed to, resulting from, or arising out of or in connection with asbestos or asbestos-containing material.

Authorized Representative

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

striior
INSURANCE SOLUTIONS

ENDORSEMENT

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.		**Endorsement #:**	3
* THIS INFORMATION IS COMPLETED ONLY WHEN THIS ENDORSEMENT IS ISSUED SUBSEQUENT TO PREPARATION OF THE POLICY.			
Company Name* :	As Per Schedule of Insurers	**Policy Number:**	CSN0015754
Named Insured* :	Ahrens Enterprises, Inc. dba AHRENS Companies	**Policy Effective Date:**	06/04/2024
Producer* :	AmWINS	**Endt. Effective Date:**	06/04/2024

CYBER LOSS LIMITED EXCLUSION

I. The following exclusion is added to Part B- EXCLUSIONS AND LIMITATIONS, 1. EXCLUSIONS:

y. Cyber loss meaning:

(1) any **LOSS***, damage, liability, expense, fine or penalties, or any other amount directly or indirectly caused by:

A. the authorized or unauthorized use, access, or operation of any **COMPUTER SYSTEM*** including **ELECTRONIC DATA*;**

B. any threat of or any hoax relating to y. (1) A. above.

C. malicious code, virus or any other harmful code that is directed at, enacted upon or introduced into any **COMPUTER SYSTEM*** and is designed to access, alter, corrupt, damage, delete, destroy, disrupt, encrypt, exploit, use or prevent or restrict access to or the use of any part of any **COMPUTER SYSTEM*** or otherwise disrupt its normal functioning or operation.

D. any denial of service attack which disrupts, prevents, or restricts access to or use of any **COMPUTER SYSTEM***, or otherwise disrupts its normal functioning or operation;

(2) any **LOSS*** of, alteration of, or damage to or a reduction in the functionality, availability, or operation of a **COMPUTER SYSTEM***; or

(3) any loss of use, reduction in functionality, repair, replacement, restoration, or reproduction of any **ELECTRONIC DATA***, including any amount pertaining to the value of such **ELECTRONIC DATA***.

Such Cyber loss is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the **LOSS***. However,

If fire and/or explosion is not excluded from this policy and a fire or explosion arises directly or indirectly from any of the events described in this exclusion, any **LOSS*** to **PROPERTY INSURED*** covered under this policy arising directly from that fire or explosion is insured, subject to the provisions of this policy.

If vandalism is not excluded from this policy and is applicable to the premises described in the Declarations, vandalism does not include a cyber incident as described in Paragraph A.

II. Solely for purposes of this endorsement, the following definitions are added to PART C – DEFINITIONS:

COMPUTER SYSTEM* means any computer, hardware, software, communications system, electronic device (including, but not limited to, smart phone, laptop, tablet, wearable device), server, cloud or microcontroller including any similar system or

any configuration of the aforementioned and including any associated input, output, data storage device, networking equipment or back up facility.

Authorized Representative

SEVENTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS SEVENTH AMENDMENT is hereby made and entered into this 29 day of August, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

W I T N E S S E T H:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid CRA No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the ITB, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR previously entered into a First Amendment to the Agreement dated April 25, 2023, to add a liquidated damages provision and clarifying certain terms of the ITB ("First Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Second Amendment to the Agreement dated October 11, 2023, to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building; and

WHEREAS the CRA and the CONTRACTOR previously entered into a Third Amendment to the Agreement dated January 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room; and

WHEREAS the CRA and the CONTRACTOR previously entered into a Fourth Amendment to the Agreement dated February 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building; and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Fifth Amendment to the Agreement dated June 20, 2024, in order to modify the Termination Date to November 21, 2024, and increase the compensation to the CONTRACTOR in an amount not to exceed $17,170.62 for materials and labor to perform column adjustments, materials and labor to add a second floor mop sink and wall bumper, materials and labor to remove a tree, storage cost for glass doors and window frames and storage cost for HVAC system; and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Sixth Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $40,843.42 for materials and labor to add a drywall header at the ceiling, to add a metal frame and anchors for louvers at the garage entrance, to increase the beam width from 8" to 12" on the East and West sides of the roof, and to account for necessary extension of the builders risk insurance due to the extension of the Termination Date; and

WHEREAS, the CRA and the CONTRACTOR desire to enter into this Seventh Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,549,77 for materials and labor to perform a directional bore related to electrical work, and in order to perform special inspections for hoist beam and interior stairs as required by the City of Delray Beach Building Inspector.

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the compensation to the CONTRACTOR in an amount not to exceed $3,549.77 for materials and labor to perform a directional bore related to electrical work, and in order to perform special inspections for hoist beam and interior stairs as required by the City of Delray Beach Building Inspector and as further set forth in the Change Orders attached as Exhibit "A" to this Seventh Amendment, which is incorporated herein by reference. The total sum due to the CONTRACTOR is amended to $2,908,646.51.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, and Sixth Amendment. The First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, and this Seventh Amendment shall remain in full force and effect, except as amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment and Seventh Amendment, this Sixth Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

IN WITNESS WHEREOF, the parties have executed this Seventh Amendment to the Agreement on the date first written above

ATTEST:

Name:

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Tom Carney, CRA Board Chair

Approved as to Form:

CRA Legal Counsel

ATTEST:

Print Name: BONNIE DANIELS

Title: HR

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: President/CEO

(SEAL)

STATE OF FLORIDA
COUNTY OF

The foregoing instrument was acknowledged before me this 29 day of August, 2024, by Richard C. Ahrens, as President/CEO (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification.

NOTARY PUBLIC

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 19
Date: 8/6/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SPECIAL INSPECTIONS FOR HOIST BEAM AND INTERIOR STAIRS

Reason: Owner Request

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 8/9/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SPECIAL INSPECTOR FEE FOR HOIST BEAM
SPECIAL INSPECTOR FEE FOR STAIR(S)

Description		Price
SPECIAL INSPECTOR FEE FOR HOIST BEAM		$275.00
SPECIAL INSPECTOR FEE FOR STAIR(S)		$275.00
GC FEE 10%		$55.00
GENERAL LIABILITY 1.33%		$7.31
BUILDERS RISK .65%		$3.58
	Subtotal:	$615.89
	Total:	**$615.89**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

Enclosure 2B

SPECIALTY ENGINEERING CONSULTANTS, Inc.

Dade • Broward • Palm Beach

May 31, 2024

Ahrens Companies
Attn: John Mangubat
1461 Kinetic Rd.
Lake Park, FL 33403

RE: Delray Beach CRA – Additional Inspection Services

PROFESSIONAL SERVICES PROPOSAL

Dear Mr. Mangubat,

Thank you for the opportunity to submit a proposal for the additional inspection services for your project Delray Beach, Florida referenced herein. We are pleased to present you with this unit price proposal for our services. Please note that our unit rates are inclusive of principal review, administration, equipment, and travel expenses.

Inspection Services

Special Inspections	$275/inspection

Please acknowledge your acceptance of this proposal including exhibits A and B by executing below and returning a copy of this letter to my attention. We at Specialty Engineering appreciate this opportunity to provide you with these professional engineering services. Please do not hesitate to contact the undersigned should you wish to discuss any of the terms of this proposal.

Respectfully submitted,
Specialty Engineering Consultants, Inc.

Abigail McCann

Abigail McCann
Director of Business Development

Agreed and Accepted:

Richard C. Ahrens 7/1/2024

Signature Date

Richard C. Ahrens President/CEO

Printed Name Title

Enclosure 2B

SPECIALTY ENGINEERING CONSULTANTS, Inc.

Dade • Broward • Palm Beach

EXHIBIT B: GENERAL CONDITIONS

1. Unless noted otherwise, building pad densities only include final lift prior to concrete placement. Building pad certifications and building pad excavation and backfilling testing and inspections should be quoted as a separate line item within this proposal.

2. Testing prices include 30 minutes of arrival time prior to testing. Any additional time due to contractor delays will be invoiced as stand by time rounded to the nearest hour per the attached schedule of fees.

3. Rates will apply to any inspection services provided to this project Monday thru Friday, 7:00AM to 4:00PM. Any services provided outside of these times will be invoiced as overtime per the attached schedule of fees.

4. All of our pricing includes principal review, administration, equipment and travel expenses.

5. Inspection and testing services are to be scheduled the day prior by 3:00pm. Services may be scheduled by calling the Specialty Engineering office at 561-752-5440. Services requested the same day will be fulfilled as soon as practically possible. Same day services may be subject to additional charges.

6. Contract includes up to 3 copies of reports. Documentation will be mailed per distribution list provided to us by the client at the start of the project.

7. Invoices will be generated monthly. Payment is due within 30 days of invoice date. Payments over 60 days past due may incur late payment interest charges in accordance with Florida Statutes.

8. Payments in the form of cash, check or ACH deposit to be made payable to Specialty Engineering Consultants, within thirty 30 days from the date of the invoice. Credit card payments greater than $500.00 will incur a 3.5% convenience fee.

9. Past due balances more than 60 days are subject to a $45 lien filing fee.

10. Customer agrees to pay any costs of collection and/or attorney fees accrued by Specialty Engineering Consultants, as a result of non-payment by said customer.

11. In an effort to minimize costs, we reserve the right to group inspections together.

12. Please allow between one hour before and two hours after the scheduled time frame for our arrival.

13. Commencement of work constitutes agreement of this proposal.

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **20**
Date: 8/20/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
DIRECTIONAL BORE FOR FPL LINE

$2,933.88

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 8/30/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

DIRECTIONAL BORE OF 2-2" AT 53 FT. EACH - PIPE TO BE SUPPLIED BY FLORIDA POWER AND LIGHT .
MOBILIZATION
SOFT DIGS (IF REQUIRED ADDITIONAL $450.00)

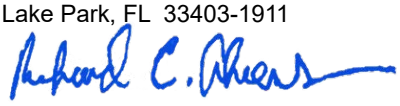
BORE APPROXIMATELY 53 FT FROM SOUT TELEPHONE POLE TO LOCATION OF NEW TRANSFORMER .
PIPE TO BE SUPPLIED BY FPL..

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$165,744.64
The Contract Amount prior to this Change Order was	$2,905,712.64
The Contract will be changed by this Change Order in the amount of	$2,933.88
The new Contract Amount including this Change Order will be	$2,908,646.52

The Contract Time will be TBD.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER . CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911



(Signature)

Richard C. Ahrens, CEO/President

By

8/20/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 20
Date: 8/20/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: DIRECTIONAL BORE FOR FPL LINE

Reason: Owner Request

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Addendum # ADDENDUM #7

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 8/30/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

DIRECTIONAL BORE OF 2-2" AT 53 FT. EACH - PIPE TO BE SUPPLIED BY FLORIDA POWER AND LIGHT .
MOBILIZATION
SOFT DIGS (IF REQUIRED $450.00 ADDITIONAL)

BORE APPROXIMATELY 53 FT FROM SOUT TELEPHONE POLE TO LOCATION OF NEW TRANSFORMER .
PIPE TO BE SUPPLIED BY FPL..

Description		Price
DIRECTIONAL BORE OF 2-2" AT 53 FT EACH (PIPE SUPPLIED BY CLIENT)		$2,120.00
MOBILIIZATION		$500.00
AHRENS FEE 10%		$262.00
GENERAL LIABILITY 1.33%		$34.85
BUILDER'S RISK .65%		$17.03
	Subtotal:	$2,933.88
	Total:	**$2,933.88**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

ADVANCED BORING, INC.

ESTIMATE

290 Truck and Trailer Way
West Palm Beach, Florida 33413
(561) 791-2590 Office
(561) 290-1563 Fax

TERMS	DATE
30 Days	8/15/2024

CUSTOMER

Jim Graveline
Ahren Companies
1461 Kinetic Road
Lake Park, Florida 33403
(561) 863-9004 Direct
jgraveline@ahrenscompanies.com

DESCRIPTION	QTY	PRICE	AMOUNT
Project: 95 SW 5th Avenue, Delray Beach			
PCN: 12-43-46-17-06-029-0280			
Subdivision: Delray Beach Resub Blk 29 In			
Mailing Address: 20 N Swinton Avenue, Delray Beach, Fl. 33444			
Owners: Delray Beach CRA			
Directional Bore of 2-2" at 53 ft. each (pipe to be supplied by customer)	**106**	**$ 20.00**	**$ 2,120.00**
Mobilization	**1**	**$ 500.00**	**$ 500.00**
Soft Digs (if required)		**$ 450.00**	*
Utilities in conflict with bore under the road will have to be dug to find depth			
* Number of utilities is unknown until locates are called into Sunshine One Call			
Thank you for your business!	**EST. TOTAL**		**$ 2,620.00**

- *The customer is responsible for obtaining all necessary permits.*
- *Advanced Boring, Inc. is not responsible for utilities not located by Sunshine One Call or Property Owner.*
- *The prices are valid for a period of 30 days.*
- *Please sign and return the document once the terms and conditions are agreed upon in order to schedule the project.*

Eduardo Monroy Jr - President
Advanced Boring, Inc.

RICHARD AHRENS
Ahren Companies

Certified Underground Utility Excavation Contractor CUC1225834

SW 5th Ave
SW 5th Ave
SW 1st St
SW 1st St
SW 1st St
SW 1st St
Location of
New
Transformer
48.23ft
FPL Pole
101
403

EIGHTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS EIGHTH AMENDMENT is hereby made and entered into this 18th day of November, 2024, (the "effective date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

WITNESSETH:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023 for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid CRA No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the ITB, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR previously entered into a First Amendment to the Agreement dated April 25, 2023, to add a liquidated damages provision and clarifying certain terms of the ITB ("First Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Second Amendment to the Agreement dated October 11, 2023, to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building ("Second Amendment"); and

WHEREAS the CRA and the CONTRACTOR previously entered into a Third Amendment to the Agreement dated January 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room ("Third Amendment"); and

WHEREAS the CRA and the CONTRACTOR previously entered into a Fourth Amendment to the Agreement dated February 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building ("Fourth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Fifth Amendment to the Agreement dated June 20, 2024, in order to modify the Termination Date to November 21, 2024, and increase the compensation to the CONTRACTOR in an amount not to exceed $17,170.62 for materials and labor to perform column adjustments, materials and labor to add a second floor mop sink and wall bumper, materials and labor to remove a tree, storage cost for glass doors and window frames and storage cost for HVAC system ("Fifth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Sixth Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $40,843.42 for materials and labor to add a drywall header at the ceiling, to add a metal frame and anchors for louvers at the garage entrance, to increase the beam width from 8" to 12" on the East and West sides of the roof, and to account for necessary extension of the builders risk insurance due

to the extension of the Termination Date ("Sixth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Seventh Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,549.77 for materials and labor to perform a directional bore related to electrical work, and in order to perform special inspections for hoist beam and interior stairs as required by the City of Delray Beach Building Inspector ("Seventh Amendment"); and

WHEREAS, the CRA and the CONTRACTOR desire to enter into this Eighth Amendment to the Agreement to modify the Termination Date of the Agreement.

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to extend the Contract Term and the completion date (Termination Date) to March 6, 2025, and the Substantial Completion date shall be thirty (30) calendar days prior to the completion date, with no increase to the compensation to the CONTRACTOR.

3. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, and Seventh Amendment. The First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, Seventh Amendment and this Eighth Amendment shall remain in full force and effect, except as

amended herein.

4. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, Seventh Amendment and Eighth Amendment, this Eighth Amendment shall control to the extent of any such conflict or ambiguity.

5. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

SIGNATURE PAGE TO FOLLOW

IN WITNESS WHEREOF, the parties have executed this Seventh Amendment to the Agreement on the date first written above

ATTEST:

Name: Renée Tadusingh

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Tom Carney, CRA Board Chair

Approved as to Form:

CRA Legal Counsel

ATTEST:

Print Name: Idy Ahrens

Title: Vice President

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: PRESIDENT/CEO

(SEAL)

STATE OF FLORIDA
COUNTY OF PALM BEACH

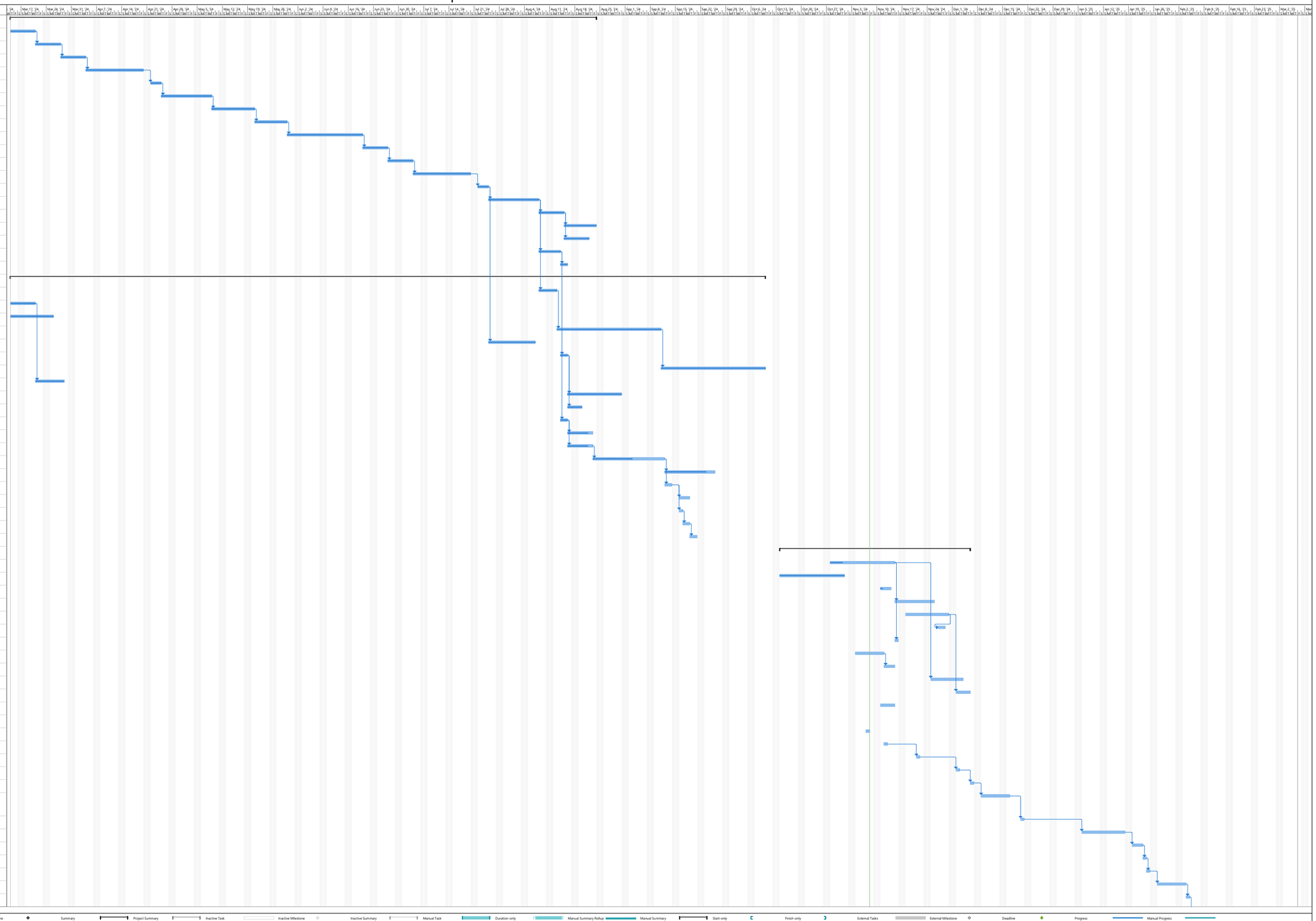
The foregoing instrument was acknowledged before me this 23 day of DEC, 2024, by RICHARD C. AHRENS, as PRESIDENT/CEO (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification.

Bonnie S. Daniels
NOTARY PUBLIC

BONNIE DANIELS
MY COMMISSION # HH521550
EXPIRES: May 27, 2028

Speculative Schedule 11.7.2024

ID	Task Name	Duration	Start	Finish	% Complete
1	**BUILDING STRUCTURE**	**117 days**	**Thu 3/14/24**	**Fri 8/23/24**	**100%**
2	Complete added column	5 days	Thu 3/14/24	Wed 3/20/24	100%
3	Install first floor precast	5 days	Thu 3/21/24	Wed 3/27/24	100%
4	Forms slab and beam sides	5 days	Thu 3/28/24	Wed 4/3/24	100%
5	Install rebar & MEP First floor slab	12 days	Thu 4/4/24	Fri 4/19/24	100%
6	Pour concrete first floor slab	3 days	Mon 4/22/24	Wed 4/24/24	100%
7	Slab Cure time	10 days	Thu 4/25/24	Wed 5/8/24	100%
8	Install second floor block	8 days	Thu 5/9/24	Mon 5/20/24	100%
9	Form and pour columns	7 days	Tue 5/21/24	Wed 5/29/24	100%
10	Form second floor concrete beams	15 days	Thu 5/30/24	Wed 6/19/24	100%
11	Install second floor Precast	5 days	Thu 6/20/24	Wed 6/26/24	100%
12	Form slab and beams	5 days	Thu 6/27/24	Wed 7/3/24	100%
13	Install rebar & MEP Second floor slab	12 days	Thu 7/4/24	Fri 7/19/24	100%
14	Pour concrete second floor slab	3 days	Mon 7/22/24	Wed 7/24/24	100%
15	Slab Cure time Roof	10 days	Thu 7/25/24	Wed 8/7/24	100%
16	Install roof block	5 days	Thu 8/8/24	Wed 8/14/24	100%
17	Form and pour elevator deck	7 days	Thu 8/15/24	Fri 8/23/24	100%
18	Form and pour roof parapet	5 days	Thu 8/15/24	Wed 8/21/24	100%
19	Remove precast shoring and forms	4 days	Thu 8/8/24	Tue 8/13/24	100%
20	Structure completed	2 days	Wed 8/14/24	Thu 8/15/24	100%
21	Interior	**150 days**	**Thu 3/14/24**	**Wed 10/9/24**	**84%**
22	Install roof MEP's	3 days	Thu 8/8/24	Mon 8/12/24	100%
23	Install roof Misc. wood framing	5 days	Thu 3/14/24	Wed 3/20/24	100%
24	Install A/C roof curbs	8 days	Thu 3/14/24	Mon 3/25/24	100%
25	Install roofing system	21 days	Tue 8/13/24	Tue 9/10/24	100%
26	Install interior stairs	9 days	Thu 7/25/24	Tue 8/6/24	100%
27	Install precast window sills	2 days	Wed 8/14/24	Thu 8/15/24	100%
28	Install roof top A/C units and Electric	21 days	Wed 9/11/24	Wed 10/9/24	100%
29	Install roof screening	6 days	Thu 3/21/24	Thu 3/28/24	100%
30	Install windows	11 days	Fri 8/16/24	Fri 8/30/24	100%
31	Install exterior metal doors	2 days	Fri 8/16/24	Mon 8/19/24	100%
32	Install interior metal studs and door frames	2 days	Wed 8/14/24	Thu 8/15/24	100%
33	Install Duct Work	5 days	Fri 8/16/24	Thu 8/22/24	75%
34	Install interior MEP rough	5 days	Fri 8/16/24	Thu 8/22/24	75%
35	Install and finish drywall	14 days	Fri 8/23/24	Wed 9/11/24	50%
36	Install ceramic Tile	10 days	Thu 9/12/24	Wed 9/25/24	75%
37	Prime drywall	2 days	Thu 9/12/24	Fri 9/13/24	0%
38	Install ceiling grid	3 days	Mon 9/16/24	Wed 9/18/24	0%
39	Install bathroom accessories and Partitions	1 day	Mon 9/16/24	Mon 9/16/24	0%
40	Finish coat of paint	2 days	Tue 9/17/24	Wed 9/18/24	0%
41	Install ceiling tiles	2 days	Thu 9/19/24	Fri 9/20/24	0%
42	**EXTERIOR WORK**	**39 days**	**Mon 10/14/24**	**Thu 12/5/24**	**24%**
43	Stucco building	14 days	Mon 10/28/24	Thu 11/14/24	25%
44	Install ceramic tile accents	14 days	Mon 10/14/24	Thu 10/31/24	100%
45	Install Accent Louvers	3 days	Mon 11/11/24	Wed 11/13/24	25%
46	Paint building exterior	7 days	Fri 11/15/24	Mon 11/25/24	0%
47	Install concrete walks	10 days	Mon 11/18/24	Fri 11/29/24	0%
48	Install handrails	2 days	Wed 11/27/24	Thu 11/28/24	0%
49	Install Canvas Canopy	1 day	Fri 11/15/24	Fri 11/15/24	0%
50	Install irrigation	6 days	Mon 11/4/24	Mon 11/11/24	0%
51	Install landscaping	3 days	Tue 11/12/24	Thu 11/14/24	0%
52	Install brick pavers	7 days	Mon 11/25/24	Tue 12/3/24	0%
53	Parking striping	4 days	Mon 12/2/24	Thu 12/5/24	0%
54	Patch asphalt road	4 days	Mon 11/11/24	Thu 11/14/24	0%
55					
56	FPL to Install Pole	1 day	Thu 11/7/24	Thu 11/7/24	0%
57	Electrician to set pad	1 day	Tue 11/12/24	Tue 11/12/24	0%
58	FPL to set transformer	1 day	Thu 11/21/24	Thu 11/21/24	0%
59	FPL to run primaries	1 day	Mon 12/2/24	Mon 12/2/24	0%
60	Electrician to run Secondaries	1 day	Fri 12/6/24	Fri 12/6/24	0%
61	Electrician to set up panel/call for electrical final	6 days	Mon 12/9/24	Mon 12/16/24	0%
62	Set Meter	1 day	Fri 12/20/24	Fri 12/20/24	0%
63	Install elevator	10 days	Mon 1/6/25	Fri 1/17/25	0%
64	Install elevator door frames	3 days	Mon 1/20/25	Wed 1/22/25	0%
65	Elevator start up	1 day	Thu 1/23/25	Thu 1/23/25	0%
66	Elevator Inspection	1 day	Fri 1/24/25	Fri 1/24/25	0%
67	Install Tile and ground in Common area	6 days	Mon 1/27/25	Mon 2/3/25	0%
68	Building final inspection	1 day	Tue 2/4/25	Tue 2/4/25	0%

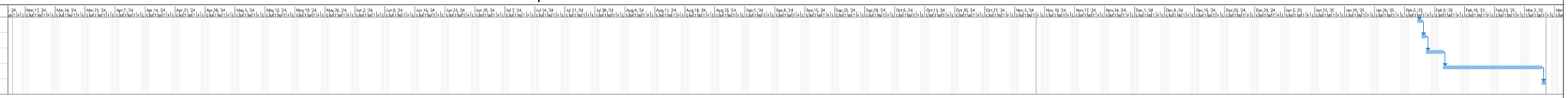


Project: DELRAY CRA 11-8-202
Date: Fri 11/8/24

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Progress · Manual Progress

Speculative Schedule 11.7.2024

ID	Task Name	Duration	Start	Finish	% Complete
69	Building certificate of Completion/TCO	1 day	Wed 2/5/25	Wed 2/5/25	0%
70	Substantial Completion	1 day	Thu 2/6/25	Thu 2/6/25	0%
71	Building final cleaning	2 days	Fri 2/7/25	Mon 2/10/25	0%
72	Complete punch list	17 days	Tue 2/11/25	Wed 3/5/25	0%
73	Turn Building Over to Delray CRA	1 day	Thu 3/6/25	Thu 3/6/25	0%



Project: DELRAY CRA 11-8-202
Date: Fri 11/8/24

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

NINTH AMENDMENT TO THE AGREEMENT BETWEEN THE DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY AND AHRENS COMPANIES

THIS NINTH AMENDMENT is hereby made and entered into this 30 day of April, 2025, (the "Effective Date") by and between the **DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY**, a public body, corporate and politic, duly created and operated pursuant to Chapter 163, Florida Statutes, (hereafter referred to as "CRA"), whose address is 20 N. Swinton Avenue, Delray Beach, Florida 33444, and **AHRENS ENTERPRISES, INC. dba AHRENS COMPANIES**, a Florida corporation (hereafter referred to as "Contractor"), whose address is 1461 Kinetic Road, Lake Park, FL 33403.

W I T N E S S E T H:

WHEREAS, the CRA and the CONTRACTOR previously entered into an Agreement dated February 23, 2023, for the 95 SW 5th Avenue Commercial Building Construction Project pursuant to the CRA's Invitation to Bid CRA No. 2022-01-R and addendums ("ITB), and the CONTRACTOR's response to the ITB, including all documents required thereunder ("Agreement"); and

WHEREAS, the CRA and CONTRACTOR previously entered into a First Amendment to the Agreement dated April 25, 2023, to add a liquidated damages provision and clarifying certain terms of the ITB ("First Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Second Amendment to the Agreement dated October 11, 2023, to increase the compensation to the CONTRACTOR in an amount not to exceed $1,500.00 for increases in the costs of materials and labor to perform necessary structural adjustments to the foundation of the commercial building ("Second Amendment"); and

WHEREAS the CRA and the CONTRACTOR previously entered into a Third Amendment to the Agreement dated January 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $102,300.34 for increases in the cost and labor to supply Garland Modified Roofing Systems as per the ITB, increases in the cost and labor to perform column adjustments, increases in the cost and labor to perform concrete, masonry, electrical and mechanical changes, and increase in cost and labor for stucco work on the exterior trash room ("Third Amendment"); and

WHEREAS the CRA and the CONTRACTOR previously entered into a Fourth Amendment to the Agreement dated February 29, 2024, in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,314.36 for materials and labor to perform necessary structural adjustments for openings at the front of the commercial building ("Fourth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Fifth Amendment to the Agreement dated June 20, 2024, in order to modify the Termination Date to November 21, 2024, and increase the compensation to the CONTRACTOR in an amount not to exceed $17,170.62 for materials and labor to perform column adjustments, materials and labor to add a second floor mop sink and wall bumper, materials and labor to remove a tree, storage cost for glass doors and window frames and storage cost for HVAC system ("Fifth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Sixth Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $40,843.42 for materials and labor to add a drywall header at the ceiling, to add a metal frame and anchors for louvers at the garage entrance, to increase the beam width from 8" to 12" on the East and West sides of the roof, and to account for necessary extension of the builders risk insurance due

to the extension of the Termination Date ("Sixth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into a Seventh Amendment to the Agreement in order to increase the compensation to the CONTRACTOR in an amount not to exceed $3,549.77 for materials and labor to perform a directional bore related to electrical work, and in order to perform special inspections for hoist beam and interior stairs as required by the City of Delray Beach Building Inspector ("Seventh Amendment"); and

WHEREAS, the CRA and the CONTRACTOR previously entered into an Eighth Amendment to the Agreement to extend the Contract Term with no increase to the compensation to the CONTRACTOR ("Eighth Amendment"); and

WHEREAS, the CRA and the CONTRACTOR desire to enter into this Ninth Amendment to the Agreement ("Ninth Amendment") to modify the Termination Date and increase the compensation to the CONTRACTOR in an amount not to $51,825.29 for materials and labor to perform additional electrical work, removal of a floor sink, installation of a janitor's sink, and costs and fees related to elevator storage and labor, builder's risk insurance, sidewalk planters, and wall packs; and

NOW THEREFORE, in consideration of the promises, mutual covenants, provisions, and undertakings hereinafter contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. That the recitals set forth above are true and correct and are incorporated herein by reference.

2. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to extend the Contract Term and the completion date (Termination Date) to June 2, 2025, and the Substantial Completion date shall be thirty (30) calendar days prior to the completion date.

3. That the CRA and the CONTRACTOR agree to amend the Agreement, as amended, to increase the compensation to the CONTRACTOR in an amount not to exceed $51,825.29 for materials and labor to perform additional electrical work, removal of a floor sink, installation of a janitor's sink, and costs and fees related to elevator storage and labor, builder's risk insurance, sidewalk planters, and wall packs.

4. That except as amended herein, the CRA and CONTRACTOR ratify, approve, and reaffirm the terms of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, Seventh Amendment, and Eighth Amendment. The First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, Seventh Amendment, Eighth Amendment, and this Ninth Amendment shall remain in full force and effect, except as amended herein.

5. In the event of any conflict or ambiguity by and between the terms and provisions of the Agreement, First Amendment, Second Amendment, Third Amendment, Fourth Amendment, Fifth Amendment, Sixth Amendment, Seventh Amendment, Eighth Amendment, and Ninth Amendment, this Ninth Amendment shall control to the extent of any such conflict or ambiguity.

6. All capitalized terms used but not defined herein shall have the meaning assigned in the Agreement, as amended.

SIGNATURE PAGE TO FOLLOW

IN WITNESS WHEREOF, the parties have executed this Ninth Amendment to the Agreement on the date first written above.

ATTEST:

Name:

DELRAY BEACH COMMUNITY REDEVELOPMENT AGENCY

Angela D. Burns, CRA Board Chair

Approved as to Form:

CRA Legal Counsel

ATTEST:

Print Name: Denise Wrzesowski

Title: Bus. Dev. / Client R.

AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES, a Florida Corporation

Print Name: Richard C. Ahrens

Title: President / CEO

(SEAL)

STATE OF FLORIDA
COUNTY OF

The foregoing instrument was acknowledged before me this 23 day of APRIL, 2025, by RICHARD C. AHRENS, as PRESIDENT/CEO (name of officer or agent, title of officer or agent), of AHRENS ENTERPIRSES, INC., dba AHRENS COMPANIES., a Florida corporation, on behalf of the corporation. He/She is personally known to me or has produced _____ (type of identification) as identification.

NOTARY PUBLIC

BONNIE DANIELS
MY COMMISSION # HH521550
EXPIRES: May 27, 2028

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 23
Date: 12/27/2024

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
ELECTRICAL CHANGE - LOCATION CHANGE OF FPL POWER

$15,488.00

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 12/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

THIS CHANGE IS FOR THE LOCATON CHANGE OF THE FPL POWER. ORIGINALLY GOING TO THE POLE TO THE NORTH EAST OF THE SITE.
CHANGED TO MOUNTED TRANSFORMER TO THE SOUTH EAST OF THE SITE .

CREDITED WAS THE CONDUIT AND WIRE TO THE OLD LOCATION AND ADDED THE NEW CONDUIT RUNS AND WIRE TO THE PAD MOUNTED TRANSFORMER.

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$15,488.00
The new Contract Amount including this Change Order will be	$2,924,134.52

The Contract Time will be increased by 45 DAYS.
The date of Substantial Completion as of the date of this Change Order therefore is 4/21/2025

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

12/27/2024

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 23
Date: 12/23/24
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: ELECTRICAL CHANGE ORDER TO LOCATION CHANGE OF FPL POWER

Reason: Design Change

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 12/31/2024 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

THIS CHANGE IS FOR THE LOCATON CHANGE OF THE FPL POWER. ORIGINALLY GOING TO THE POLE TO THE NORTH EAST OF THE SITE.
CHANGED TO MOUNTED TRANSFORMER TO THE SOUTH EAST OF THE SITE .

CREDITED WAS THE CONDUIT AND WIRE TO THE OLD LOCATION AND ADDED THE NEW CONDUIT RUNS AND WIRE TO THE PAD MOUNTED TRANSFORMER.

Description		Price
ELECRICAL CONDUIT RUN TO FPL TRANSFORMER RELOCATION ACROSS THE STREET FROM PROJECT		$18,925.85
CREDIT FOR MATERIAL		$-2,328.58
CREDIT LABOR		$-2,766.25
ADJUSTMENT		$-0.02
GC FEE 10% ON $13,831.00		$1,383.15
GENERAL LIABIITY 1.33%		$183.95
BOND FEE ..65%		$89.90
	Subtotal:	$15,488.00
	Total:	**$15,488.00**

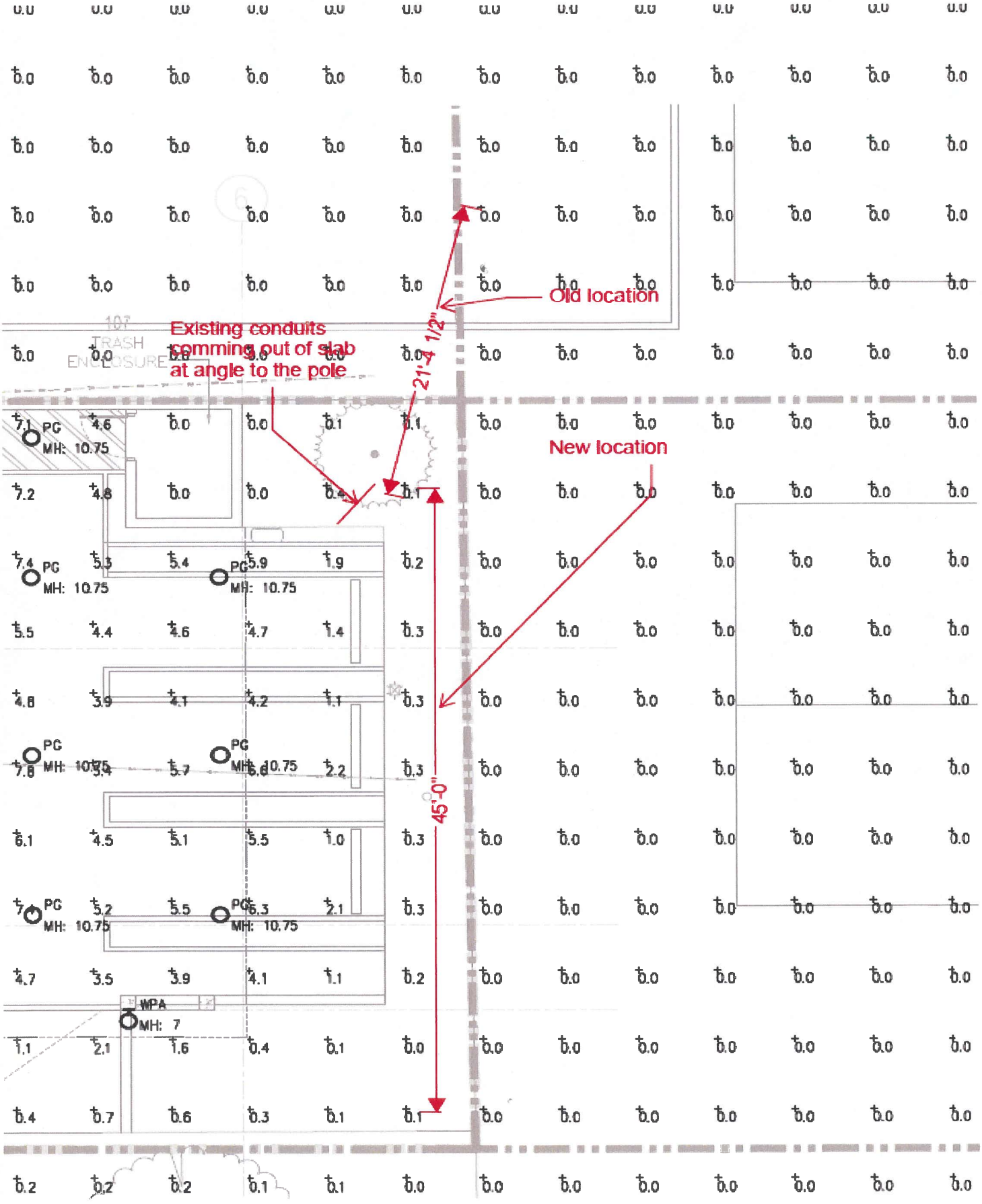
Please note that AHRENS COMPANIES will require an extra 45 days.

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____


Old location
Existing conduits comming out of slab at angle to the pole
21'-4 1/2"
New location
45'-0"
TRASH ENCLOSURE
PG
MH: 10.75
WPA
MH: 7

LANGER
ELECTRIC SERVICE CO.
SINCE 1939

Change Order Request #3 Revised

November 14th 2024
Aherns Companies
1461 Kinetic Road
Lake Park, FL 33403
Phone: (561) 839-2822
Attn: Mark Mdavidson@ahernscompanies.com
Project Name: **CRA Development Project**

Reference: Secondary power change	Revision #:	Architect:
LEC Job #: 2230010	Rev.#	Engineer:

We are pleased to submit a change order request to perform the additional electrical work requested for the above referenced project. This proposal is based upon performing the work detailed in the revisions noted above using the most economical practices of the industry with the addition of the terms and qualifications listed below.

Description of Change: This change is for the location change of the FPL power. Originally we were going to the pole to the north east of the site. Now there is a FPL pad mounted transformer to the south east of the site.
We have credited the conduit and wire to the pole and added the new conduit runs and wire to the pad mounted transformer.
The pad is onsite and will be set in place by others.
Langer will only run our conduits to the pad mounted transformer.

Terms and Conditions:

1) Langer Electric will proceed with this change order upon receipt of a signed change order.
2) We will order material and/or equipment upon written approval to proceed.
3) All work is to be completed during regular business hours, Monday through Friday 7:00AM to 3:30PM.
4) This work will require 5 day(s) added to the construction schedule.
5) No permit or permit fees included.
6) This change order is only for the scope of work as stated above under *Description of Change*. Any other work required will result in additional costs.
7) We reserve the right to correct his quote for errors and omissions.
8) This change order is based on present job conditions. Any changes to the job conditions that affect this change order will result in an increased cost based on the impact of the changed conditions.
9) This quote covers direct costs only and we reserve the right to claim for cumulative impacts and consequential costs.
10) Permit fees are not included. The customer will submit permit and pay all fees.

Total Amount of this change: **Thirteen Thousand Eight Hundred Thirty-One Dollars ($13,831.00).**

We will require 5 additional day(s) added to the work schedule previously issued.

Thank you for the opportunity to submit this proposal for additional work on the above referenced project and hope that we may have the privilege of completing this work for you. If accepted, please sign and return this proposal, noting the terms and conditions of the contract, and return it to our office while keeping a copy for your files. Please note this work will not proceed until an executed change order is received in our office.

Approved and Accepted

By: _____
Rick Reuter, Project Manager
Langer Electric Company
EC# 00001959

By: _____
Owner or Agent for Owner
Accepted _____ day of _____ _, _____

LANGER

ELECTRIC SERVICE CO.
SINCE 1939

	Hr	Rate	Cost
Credit Material			-$2,328.58
New Material Charges			$5,508.85
Credit Labor	-36.89		
New Work Labor	84.29		
New Labor Cost	47.4	75/Hr	$3,555.75
New Work Added Forman	11.85	85/Hr	$1,007.25
Brooks Box			$1,610.00
Equipment			$1,662.00
Material Tax			$335.32
GC's			$80.00
Overhead 10%			$1,143.06
Profit 10%			$1,257.37
Adjustment			-$0.02
Change Order Total			$13,831.00

OFFICES IN DADE • BROWARD • PALM BEACH
CORPORATE OFFICE: 6500 NW 21ST AVENUE, SUITE 1 • FORT LAUDERDALE,FL 33309
PHONE: (954) 984-8489 • FAX: (954) 984-8668

1	|| BASE BID	3,180.27	47.41
	Total	3,180.27	47.41

	Direct Labor	Hours	Rate	Total
1	JOURNEYMAN	47.41	75.00	3,555.75
2	FOREMAN @ 25%	11.85	85.00	1,007.25
	Totals	59.26	77.00	4,563.00

	General Expenses	Qty	Duration	Total
1	FUEL CHARGE	1.00		80.00
	Totals			80.00

	Equipment	Qty	Duration	Cost / Unit	Total Cost	Total
1	BACKHOE (per Hour)	1.00		887.00	887.00	887.00
2	Compactor	1.00		395.00	395.00	395.00
3	DELIVERY AND FEES FOR RENTAL E	1.00		380.00	380.00	380.00
	Totals				1,662.00	1,662.00

	Quoted Materials	Cost	Total	Vendor
1	BROOKS BOX	1,610.00	1,610.00	ESI
	Totals	1,610.00	1,610.00	

	Summary	%	Value
	General Materials		3,180.27
	General Materials Adjustment		
	Quoted Materials		1,610.00
	Quoted Materials Adjustment		
	Material Adjustment		
	Material Tax	7.000	335.32
	Material Overhead		
	Material Markup		
	Total Material		5,125.59
	Direct Labor		4,563.00
	Indirect Labor		
	Labor Burden		
	Labor Fringes		
	Labor Tax		
	Labor Overhead		
	Labor Markup		
	Total Labor		4,563.00
	General Expenses		80.00
	Equipment		1,662.00
	Sub Total		11,430.59
	Credit ($)		
	Discount (%)		
	Overhead	10.000	1,143.06
	Markup	10.000	1,257.37

	Sub Total		13,831.02
	Subcontracts		
	Unit Prices		
	Sub Total		13,831.02
	Credit ($)		
	Discount (%)		
	Adjustment #1		
	Adjustment #2		
	Adjustment #3		
	Final Adjustment		-0.02
	Selling Price		13,831.00
	VAT		
	Final Amount		13,831.00

SUNBELT RENTALS

PC#: 0113
114 NW 20TH ST
BOCA RATON, FL 33431 7949
561-391-3601

SUNBELT RENTALS, INC.

Salesman: 011316 MADINE, JENNIFER (11
Typed By: MSPORDER

Job Site:
DELRAY CRA
95 SW 5TH AVE
DELRAY BEACH, FL 33444

C#: 954-984-8489 J#: 954-798-7508

QUOTE

Customer: 5101528
LANGER ELECTRIC CO
6500 NW 21ST AVENUE STE 1
** ROLS SWAP ONLY***
FORT LAUDERDALE, FL 33309

Contract #.. 161498816
Contract dt. 10/30/24
Date out.... 11/04/24 10:00 AM
Est return.. 11/11/24 10:00 AM
Job Loc..... 95 SW 5TH AVE, DELRAY BEACH
Job No..... DELRAY CRA
P.O. #..... TBD
Ordered By.. BATTEEN, ADAM
NET 30

For operations in Florida: Prima facie evidence of intent to defraud: Failure to return rental property or equipment upon expiration of rental period and failure to pay all amounts due (including costs for damage to the property or Equipment) are evidence of abandonment or refusal to redeliver the property, punishable in accordance with Section 812.155, Florida Statutes.

QTY	EQUIPMENT #	Min	Day	Week	4 Week	Amount
1.00	7,500LB MINI EXCAVATOR 0350140	315.00	315.00	887.00	1823.00	887.00
1.00	5.5K 19' TELEHANDLER FORKLIFT 0560230 # standard forks	402.00	402.00	859.00	1960.00	859.00
1.00	PLATE TAMPER REVERSIBLE 300LB 0640230	150.00	150.00	395.00	780.00	395.00

*** EQP MSG ***
ALWAYS LOAD, TRANSPORT AND MOVE MACHINES WITH THE ARM IN A TUCKED POSITION
PLEASE ENSURE TO USE THE PROPER ATTACHMENT TO PREVENT TIP OVER/CENTER OF GRAVITY ISSUES
** ALWAYS REFER TO THE EQUIPMENT LOAD CHART AS TO ACTUAL LIFTING CAPACITIES IN ALL THE EQUIPMENT'S LOAD RANGES **
WARNING - FORKLIFTS ARE NOT TO BE USED FOR LIFTING PERSONNEL

SALES ITEMS:

Qty	Item number	Unit	Price	
1	DLPKSRCHG TRANSPORTATION SURCHARGE	EA	87.500	87.50
1	ENVIRONMENTAL 2133XXX000 ENVIRON/HAZMAT/DISPOSAL FEE	EA	41.740	41.74
	DELIVERY CHARGE			250.00

IF THE EQUIPMENT DOES NOT WORK PROPERLY, NOTIFY THE OFFICE AT ONCE | MULTIPLE SHIFTS OR OVERTIME RATES MAY APPLY | CUSTOMER IS RESPONSIBLE FOR REFUELING, DAMAGES AND REPAIRS

1. The total charges are an estimate based on the estimated rental period and other information provided by Customer.
2. Customer assumes all risks associated with the Equipment during the Rental Period, including injury and damage to persons, property and the Equipment.
3. Customer is responsible for and shall only permit properly trained, Authorized Individuals to use the Equipment.
4. If the Equipment does not operate properly, is not suitable for Customer's intended use, does not have operating and safety instructions or Customer has any questions regarding use of the Equipment, Customer shall not use the Equipment and shall contact Sunbelt immediately.
5. Equipment misuse or using damaged or malfunctioning Equipment may result in serious bodily injury or death and Customer agrees that Customer (i) assumes all risk associated thereunder, and (ii) indemnifies Sunbelt Entities for all claims or damages as a result of misuse or use of damaged or malfunctioning Equipment.
6. Customer has received, read, understands and agrees to the estimated charges and all the terms on this page, plus all sections on the reverse side of this Contract ("Sections"), including Release and Indemnification in Section 8 and Environmental Fee in Section 16, which can also be found at www.sunbeltrentals.com/rentalcontract. * Delivery/Pickup Surcharge fee explanation is available at www.sunbeltrentals.com/surcharge.
7. Customer must contact Sunbelt to request pickup of Equipment, retain the Pick-Up Number given by Sunbelt and will be responsible for Equipment until actuallyretrieved by Sunbelt.
8. Customer waives its right to a jury trial in any dispute as set forth in Section 19.
9. At the election of Sunbelt or Customer, Customer agrees to submit every dispute to arbitration and waives any right to bring a class action as set forth in Section 20.

Customer is declining Rental Protection Plan (see reverse side for details) _____ (Customer Initials)

Customer Signature | Date | Name Printed | Delivered By | Date

SUNBELT RENTALS

PC#: 0113
114 NW 20TH ST
BOCA RATON, FL 33431 7949
561-391-3601

SUNBELT RENTALS, INC.

Salesman: 011316 MADINE, JENNIFER (11
Typed By: MSPORDER

Job Site:
DELRAY CRA
95 SW 5TH AVE
DELRAY BEACH, FL 33444

C#: 954-984-8489 J#: 954-798-7508

QUOTE

Customer: 5101528
LANGER ELECTRIC CO
6500 NW 21ST AVENUE STE 1
** ROLS SWAP ONLY***
FORT LAUDERDALE, FL 33309

Contract #.. 161498816
Contract dt. 10/30/24
Date out.... 11/04/24 10:00 AM
Est return.. 11/11/24 10:00 AM
Job Loc..... 95 SW 5TH AVE, DELRAY BEACH
Job No..... DELRAY CRA
P.O. #..... TBD
Ordered By.. BATTEEN, ADAM
NET 30

For operations in Florida: Prima facie evidence of intent to defraud: Failure to return rental property or equipment upon expiration of rental period and failure to pay all amounts due (including costs for damage to the property or Equipment) are evidence of abandonment or refusal to redeliver the property, punishable in accordance with Section 812.155, Florida Statutes.

QTY	EQUIPMENT #	Min	Day	Week	4 Week	Amount
SALES ITEMS:						
Qty	Item number	Unit	Price			
	PICKUP CHARGE					250.00

Sub-total:	2770.24
Tax:	158.92
Total:	2929.16

All amounts are in USD

IF THE EQUIPMENT DOES NOT WORK PROPERLY, NOTIFY THE OFFICE AT ONCE

MULTIPLE SHIFTS OR OVERTIME RATES MAY APPLY

CUSTOMER IS RESPONSIBLE FOR REFUELING, DAMAGES AND REPAIRS

1. The total charges are an estimate based on the estimated rental period and other information provided by Customer.
2. Customer assumes all risks associated with the Equipment during the Rental Period, including injury and damage to persons, property and the Equipment.
3. Customer is responsible for and shall only permit properly trained, Authorized Individuals to use the Equipment.
4. If the Equipment does not operate properly, is not suitable for Customer's intended use, does not have operating and safety instructions or Customer has any questions regarding use of the Equipment, Customer shall not use the Equipment and shall contact Sunbelt immediately.
5. Equipment misuse or using damaged or malfunctioning Equipment may result in serious bodily injury or death and Customer agrees that Customer (i) assumes all risk associated thereunder, and (ii) indemnifies Sunbelt Entities for all claims or damages as a result of misuse or use of damaged or malfunctioning Equipment.
6. Customer has received, read, understands and agrees to the estimated charges and all the terms on this page, plus all sections on the reverse side of this Contract ("Sections"), including Release and Indemnification in Section 8 and Environmental Fee in Section 16, which can also be found at www.sunbeltrentals.com/rentalcontract. * Delivery/Pickup Surcharge fee explanation is available at www.sunbeltrentals.com/surcharge.
7. Customer must contact Sunbelt to request pickup of Equipment, retain the Pick-Up Number given by Sunbelt and will be responsible for Equipment until actuallyretrieved by Sunbelt.
8. Customer waives its right to a jury trial in any dispute as set forth in Section 19.
9. At the election of Sunbelt or Customer, Customer agrees to submit every dispute to arbitration and waives any right to bring a class action as set forth in Section 20.

Customer is declining Rental Protection Plan (see reverse side for details) _____ (Customer Initials)

Customer Signature | Date | Name Printed | Delivered By | Date

SUNBELT RENTALS TERMS AND CONDITIONS

1) **DEFINITIONS.** "Authorized Individuals" are those individuals that Customer directly or indirectly allows to use the Equipment, who must be properly trained to use the Equipment. at least 18 years old or the legal age of majority in the state, whichever is greater and are not under the influence of any drugs, alcohol, substances or otherwise impaired. "Customer" is identified earlier and includes any of your representatives, agents, officers, employees or anyone signing this Contract on your behalf. "Environmental Services Charge" is the charge described in Section 17. "Equipment" is the equipment and/or services identified on the other pages provided, together with all replacements, repairs, additions, attachments and accessories and all future Equipment rented. "Incident" is any fine, citation, theft, accident, casualty, loss, vandalism, injury, death or damage to person or property, claimed by any person or entity that appears to have occurred in connection with the Equipment. "Lost" means the Equipment is either stolen, its location is unknown, or Customer is unable to recover it for a period of 30 days. "FMV" is the Equipment's fair market value on or about the date of the Incident relating to the Equipment, plus any administrative fees and expenses . "One Shift" means not more than 8 hours per day, 40 hours per week and 160 hours every 4-week period, provided that double shift will be 150% and triple shift will be 200% of the rental charge on Equipment with hour meters. Ordinary Wear and Tear" means normal deterioration considered reasonable in the equipment rental industry for One Shift use. "Party" means Sunbelt or Customer and together both are the "Parties". "Pick-Up Number" is the number Customer obtains from Sunbelt evidencing the Customer's call to pick up Equipment. "Rental Period" commences when the Equipment is delivered to Customer or the Site Address and continues until the Equipment is returned to the Store or picked up by Sunbelt during normal business hours, provided Customer has otherwise complied with this Contract. "RPP" is the rental protection plan described in Section 10. "Site Address" is the location that Customer represents the Equipment will be located during the Rental Period identified earlier. "Store" is the Sunbelt location identified earlier. "Sunbelt" is Sunbelt and its affiliated companies, their respective officers, directors, employees and agents. "Telematics Data" is data collected within the Equipment or via software relating to the Equipment, its performance, location, or operators. Transportation Surcharge" is a charge intended to defray a wide range of transportation expenses (both direct and indirect), which are not always fully recovered by other transportation charges

2) **TERMS.** Customer's execution of this Contract or taking possession of the Equipment (whichever occurs first) shall be deemed acceptance of the terms herein for this and all past and future contracts between Sunbelt and Customer upon Customer's receipt of Sunbelt's Equipment under those contracts. Customer rents the Equipment from Sunbelt pursuant to this Contract, which is a true lease. The Equipment (a) is and shall remain the personal property of Sunbelt and (b) shall not be affixed to any other property. Customer shall not pledge or encumber the Equipment in any manner.

3) **PERMITTED USE.** Customer agrees and warrants that (a) Sunbelt has no control over the manner in which the Equipment is operated during the Rental Period by Customer or any third party that Customer implicitly or explicitly permits, (b) prior to each use and its return to Sunbelt, Customer shall inspect the Equipment to confirm that the Equipment is in good condition, without defects, readable decals are on the Equipment, and the Equipment is suitable for Customer's intended use; (c) Customer has access to and reviews the operating and safety instructions and will operate the Equipment in accordance with the manufacturer's instructions and with applicable safety equipment; (d) any apparent agent at the Site Address is authorized to accept delivery of the Equipment (and if Customer requests, Customer authorizes Sunbelt to leave the Equipment at the Site Address without requirement of written receipt); (e) Customer shall immediately stop use and notify Sunbelt if the Equipment is damaged, unsafe, disabled, malfunctioning, warning lights come on, levied upon, threatened with seizure, Lost, or if any Incident occurs; (f) Customer has received from Sunbelt all information needed or requested regarding the operation of the Equipment; (g) Sunbelt is not responsible for providing operator or other training unless Customer specifically requests in writing and Sunbelt agrees to provide such training (Customer being responsible to obtain all training that Customer desires prior to the Equipment's use); (h) Sunbelt is not responsible for Customer's obligation to provide reasonable accommodation(s) to any (disabled) Authorized Individual(s); (i) only Authorized Individuals shall use and operate the Equipment. however Customer is responsible for the Equipment and its use during the Rental Period regardless of the user; (j) the Equipment shall be used and maintained in a careful manner, within the Equipment's capacity and in compliance with all applicable laws, regulations, as well as all operating and safety instructions provided on, in or with the Equipment and all applicable federal, state and local laws, permits and licenses, including but not limited to, OSHA and ADA, as revised; (k) the Equipment shall be kept in a secure location; and (l) Customer shall provide Sunbelt with accurate and complete information, which Sunbelt relies upon to provide the appropriate Equipment to Customer.

4) **PROHIBITED USE.** Customer shall not (a) alter or cover up any decals or insignia on the Equipment, remove any operating or safety equipment or instructions or alter or tamper with the Equipment; (b) assign its rights under this Contract; (c) move the Equipment from the Site Address without Sunbelt's written consent; (d) use the Equipment in a negligent, illegal, unauthorized or abusive manner; or (e) publicize use of the Equipment in any manner (including, without limitation, print, audiovisual or electronic); or (f) allow the use of the Equipment by anyone other than Authorized Individuals (Customer acknowledging that the Equipment may be dangerous if used improperly or by untrained parties).

5) **MAINTENANCE.** Customer shall perform routine maintenance on the Equipment, including routine inspections and maintenance of fuel and oil levels, grease, cooling and fluid systems, batteries, tires/tracks cutting edges, and cleaning in accordance with the manufacturer's specifications, as applicable. All other maintenance or repairs may only be performed by Sunbelt or its agents, but Sunbelt has no responsibility during the Rental Period to inspect or perform any maintenance or repairs unless Customer requests a service call. If Sunbelt determines that repairs to the Equipment are needed, other than Ordinary Wear and Tear, Customer shall pay the full repair charges, additional fees, if any, and rental of the Equipment until the repairs are completed. If Equipment is stolen or damaged in excess of 40% of the Equipment's FMV, Customer will be responsible for the FMV of the Equipment, including sales tax, as applicable. Sunbelt has the right to inspect the Equipment wherever located. Customer has the authority to and hereby grants Sunbelt and its agents the right to enter the physical location of the Equipment for the purposes set forth herein. Sunbelt shall be responsible for repairs needed because of Ordinary Wear and Tear. Customer agrees that repair or replacement of the Equipment is Customer's exclusive remedy for Sunbelt's breach of this Section. Notwithstanding Sunbelt's service commitment, if Customer breaches this Contract, Sunbelt shall have no obligation to stop the Rental Period, commence repairs or rent other equipment to Customer until Customer or its agent agrees to pay for such charges.

6) **CUSTOMER LIABILITY. DURING THE RENTAL PERIOD, CUSTOMER ASSUMES ALL RISK ASSOCIATED WITH THE POSSESSION, CONTROL OR USE OF THE EQUIPMENT, INCLUDING BUT NOT LIMITED TO, PERSONAL INJURY, DEATH, RENTAL CHARGES, THEFT, LOSSES, DAMAGES AND DESTRUCTION, INCLUDING CUSTOMER TRANSPORTATION, LOADING AND UNLOADING, WHETHER OR NOT THE CUSTOMER IS AT FAULT.** After an Incident, Customer shall (a) immediately notify Sunbelt, the police, if necessary, and Customer's insurance carriers; (b) secure and maintain the Equipment and the surrounding premises in the condition existing at the time of such Incident, until Sunbelt or its agents investigate; (c) immediately submit copies of all police or other third party reports to Sunbelt; and (d) as applicable, pay Sunbelt, in addition to other sums due herein, the rental rate for Equipment until the repairs are completed or Equipment replaced plus either (i) the FMV or (ii) the full charges of recovery and repairs of damaged Equipment. Accrued rental charges shall not be applied against these amounts. Sunbelt shall have the immediate right, but not obligation, to reclaim any Equipment involved in any Incident.

7) **NO WARRANTIES. SUNBELT DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT, ITS DURABILITY, CONDITION, MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR ANY PARTICULAR PURPOSE. CUSTOMER ACKNOWLEDGES ACCEPTANCE OF THE EQUIPMENT ON AN "AS IS, WHERE IS" BASIS, WITH "ALL FAULTS" AND WITHOUT ANY RECOURSE WHATSOEVER AGAINST SUNBELT ENTITIES. CUSTOMER ASSUMES ALL RISKS ASSOCIATED WITH THE EQUIPMENT AND RELEASES SUNBELT ENTITIES FROM ALL LIABILITIES AND DAMAGES (INCLUDING LOST PROFITS, PERSONAL INJURY, AND SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES) IN ANY WAY CONNECTED WITH THE EQUIPMENT, ITS INSTALLATION, OPERATION OR USE OR ANY DEFECT OR FAILURE THEREOF, A BREACH OF SUNBELT'S OBLIGATIONS HEREIN OR ERRORS OR INACCURACIES IN INFORMATION OBTAINED FROM CUSTOMER OR THIRD PARTIES, UPON WHICH SUNBELT RELIES; PROVIDED HOWEVER, IF CUSTOMER IS A CONSUMER UNDER APPLICABLE LAW, THEN NO CONSEQUENTIAL DAMAGES LIMITIATION OF INJURIES TO PERSONS SHALL APPLY.**

8) **RELEASE AND INDEMNIFICATION. TO THE FULLEST EXTENT PERMITTED BY LAW, CUSTOMER INDEMNIFIES, RELEASES, HOLDS SUNBELT ENTITIES HARMLESS AND AT SUNBELT'S REQUEST, DEFENDS SUNBELT ENTITIES (WITH COUNSEL APPROVED BY SUNBELT), FROM AND AGAINST ALL LIABILITIES, CLAIMS, LOSSES, DAMAGES, AND EXPENSES (INCLUDING ATTORNEY'S AND/OR LEGAL FEES AND EXPENSES) HOWEVER ARISING OR INCURRED, RELATED TO ANY INCIDENT, DAMAGE TO PROPERTY, INJURY OR DEATH OF ANY PERSON, CONTAMINATION OR ALLEGED CONTAMINATION, OR VIOLATION OF LAW OR REGULATION CAUSED BY OR CONNECTED WITH THE (a) ACCESS, USE, POSSESSION OR CONTROL OF THE EQUIPMENT BY CUSTOMER OR ANY THIRD PARTY THAT CUSTOMER IMPLICITLY OR EXPLICITLY PERMITS TO ACCESS, USE, POSSESS OR CONTROL THE EQUIPMENT DURING THE RENTAL PERIOD OR (b) BREACH OF THIS CONTRACT, WHETHER OR NOT CAUSED IN PART BY THE ACTIVE OR PASSIVE NEGLIGENCE OR OTHER FAULT OF ANY PARTY INDEMNIFIED HEREIN AND ANY OF THE FOREGOING ARISING OR IMPOSED IN ACCORDANCE WITH THE DOCTRINE OF STRICT OR ABSOLUTE LIABILITY. CUSTOMER ALSO AGREES TO WAIVE ITS WORKERS' COMPENSATION IMMUNITY, TO THE EXTENT APPLICABLE. CUSTOMER'S INDEMNITY OBLIGATIONS SHALL SURVIVE THE EXPIRATION OR TERMINATION OF THIS CONTRACT.** All of Customer's indemnification obligations under this paragraph shall be joint and several.

9) **INSURANCE.** During the Rental Period, Customer shall maintain, at its own expense, the following minimum insurance coverage: (a) for Customers using Equipment for non personal use, general liability insurance of not less than $1,000,000 per occurrence, including coverage for Customer's contractual liabilities herein such as the release and indemnification clause contained in Section 8; (b) for Customers using Equipment for non personal use, property insurance against loss by all risks to the Equipment, in an amount at least equal to the FMV thereof, unless RPP is elected at the time of rental and paid for prior to any Incident; (c) worker's compensation insurance as required by law; and (d) automobile liability insurance (including comprehensive and collision coverage, and uninsured/underinsured motorist coverage), in the same amounts set forth in subsections (a) and (b), if the Equipment is to be used on any roadway. Such policies shall be primary, non-contributory, on an occurrence basis, contain a waiver of subrogation, name Sunbelt and its agents as an additional insured (including an additional insured endorsement) and loss payee, and provide for Sunbelt to receive at least 30 days prior written notice of any cancellation or material change. Any insurance that excludes boom damage or overturns is a breach. Customer shall provide Sunbelt with certificates of insurance to insurancecertificates@sunbeltrentals.com evidencing the coverages required above prior to any rental and any time upon Sunbelt's request. To the extent Sunbelt Entities carry any insurance, Sunbelt Entities' insurance will be considered excess insurance. The insurance required herein does not relieve Customer of its responsibilities, indemnification, or other obligations provided herein, or for which Customer may be liable by law or otherwise.

10) **RENTAL PROTECTION PLAN.** Customer's repair or replacement responsibility in Sections 5 and 6 of this Contract is modified by the RPP, if offered on the Equipment, and Sunbelt shall limit the amount Sunbelt collects from Customer for the Equipment loss, damage or destruction to the following amounts for each piece of Equipment, per each occurrence: (a) 10% of the FMV for Lost Equipment, up to a maximum of $500 per piece of Equipment; (b) 10% of the repair charges for incidental or accidental damage to Equipment, up to a maximum of $500 per piece of Equipment; (c) charges in excess of $50 per tire for tire repairs; and (d) nothing for the rental charges which would otherwise accrue during the period when damaged or destroyed Equipment is being repaired or replaced by Sunbelt or Lost Equipment is being replaced; provided however, the foregoing RPP liability reduction only applies if the Conditions (defined below) are satisfied and an Exclusion (defined below) does not apply. The RPP is NOT INSURANCE and does NOT protect Customer from liability to Sunbelt or others arising out of possession, control or use of the Equipment, including injury or damage to persons or property. **THE RPP IS A CONTRACTUAL MODIFICATION OF CUSTOMER'S LIABILITY.** All of the following **"Conditions"** must be satisfied for the RPP and the corresponding liability reduction to apply: (i) Customer accepts the RPP in advance of the rental; (ii) Customer pays 15% of the gross rental charges as the fee for the RPP (plus applicable taxes); (iii) Customer fully complies with the terms of this Contract; (iv) Customer's account is current at the time of the loss, theft, damage or destruction of the Equipment; and (v) none of the Exclusions apply. Customer assumes the Exclusion risks, meaning that if any Exclusion occurs, the RPP does NOT reduce the liability of Customer to Sunbelt for the loss, theft, damage or destruction resulting from such Exclusion. **"Exclusions"** shall mean loss, theft, damage or destruction of the Equipment: (A) due to intentional misuse; (B) caused by Lost Equipment not reported by Customer to the police within 48 hours of discovery, and substantiated by a written police report (promptly delivered to Sunbelt); (C) due to floods, water level changes, wind, storms, earthquakes or Acts of God; and (D) accessories or Equipment for which Customer is not charged the RPP fee. **THE EXCLUSIONS REMAIN THE LIABILITY OF CUSTOMER AND ARE NOT MODIFIED BY THE RPP. RPP IS REFLECTED ON THIS CONTRACT AS PART OF CUSTOMER'S ESTIMATED CHARGES UNLESS CUSTOMER HAS ELECTED TO DECLINE RPP IN WRITING, FAILS TO PAY THE RPP FEE OR MADE OTHER CONTRACTUAL ARRANGEMENTS WITH SUNBELT.** Notwithstanding anything to the contrary in this Contract, if Lost Equipment is later recovered, Sunbelt retains ownership of the Equipment regardless of any payments made by Customer or Customer's insurance company with respect to such Equipment, all of which payments are non-refundable. Customer agrees to promptly return any Equipment that is recovered. Sunbelt shall be subrogated to Customer's rights to recover against any person or entity relating to any loss, theft, damage or destruction to the Equipment. Customer shall cooperate with, assign Sunbelt all claims and proceeds arising from such loss, theft, damage or destruction, execute and deliver to Sunbelt whatever documents are required and take all other necessary steps to secure in Sunbelt such rights, at Customer's expense.

11) **RENTAL RATES.** The total charges specified in this Contract are: (a) estimated based upon Customer's representation of the estimated Rental Period identified herein (rental rates beyond the estimated Rental Period may change) and other information conveyed by Customer to Sunbelt; and (b) for the Equipment's use for One Shift, unless otherwise noted. Weekly and 4 week rental rates shall not be prorated. Rental charges accrue during Saturdays, Sundays and holidays. The rental rates do not include and Customer is responsible for, (i) all consumables, fees, licenses, present and future taxes and any other governmental charges based on Customer's possession and/or use of the Equipment, including additional fees for more than One Shift use; (ii) delivery and pickup charges to and from the Store, including but not limited to any freight, transportation, delivery, pickup and surcharge fees listed in this Contract; (iii) maintenance, repairs and replacements to the Equipment as provided herein; (iv) a cleaning fee if required; (v) miscellaneous charges, such as fees for lost keys, RPP, costs to recover Equipment, emergency mobilization or store opening; (vi) fuel used during the Rental Period and for refueling Equipment as described below; (vii) fines for use of dyed diesel fuel in on-road Equipment; and (viii) an Environmental Services Charge (see www.sunbeltrentals.com/environmentalfee) and (ix) Transportation Surcharge (see www.sunbeltrentals.com/surcharge). The convenience charge for off road diesel fuel does not include governmental motor fuel taxes or charges. Sunbelt collects these fees as revenue and uses them at its discretion.

12) **PAYMENT.** Customer shall pay for the rental of Equipment, sale of Equipment, materials and all other items and services identified in this Contract and all other amounts due, without any offsets, in full, in advance at the time of rental, unless Sunbelt approves Customer's executed commercial credit application. Commercial customers who are approved for Sunbelt's extended payment terms must pay, in arrears, upon receipt of Sunbelt's invoice, either by cash, check or ACH. Customer must notify Sunbelt in writing of any disputed amounts, including credit card charges, within 15 days after the receipt of the invoice/contract or Customer shall be deemed to have irrevocably waived its right to dispute such amounts. At Sunbelt's discretion, any account with a delinquent balance may be placed on a cash basis, deposits may be required and the Equipment may be picked up without notice. Due to the difficulty in fixing actual damages caused by late payment, Customer agrees that a service charge equal to the lesser of 1.5% per month or the maximum rate permitted by law shall be assessed on all delinquent accounts, until paid in full. Customer shall reimburse Sunbelt for all costs incurred in collecting any late payments, including, without limitation, attorneys' fees. Payment of any late charge does not excuse Customer of any default under this Contract. Customer shall pay a fee of $75 for each check returned for lack of sufficient funds to compensate Sunbelt for its overhead for processing missed payment. Deposits will only be returned after all amounts are paid in full. **CUSTOMER AGREES THAT IF A CREDIT OR DEBIT CARD IS PRESENTED TO PAY FOR CHARGES OR TO GUARANTEE PAYMENT, CUSTOMER AUTHORIZES SUNBELT TO CHARGE THE CREDIT OR DEBIT CARD ALL AMOUNTS SHOWN ON THIS CONTRACT AND CHARGES SUBSEQUENTLY INCURRED BY CUSTOMER, INCLUDING BUT NOT LIMITED TO, LOSS OF OR DAMAGE TO THE EQUIPMENT AND EXTENSION OF THE RENTAL PERIOD.** Effective June 1, 2021 and where permitted by law, Sunbelt may impose a surcharge of 2% (minimum $3) for credit card payments on charge accounts. This surcharge is not greater than Sunbelt's merchant discount rate for credit card transactions and is subject to sales tax in some jurisdictions.

13) **RETURN OF EQUIPMENT.** Sunbelt may terminate this Contract at any time, for any reason. The Equipment shall be returned to Sunbelt (when needed for inspections, maintenance and at the end of the Rental Period) in the same condition it was received, less Ordinary Wear and Tear and free of any hazardous materials and contaminants. Customer will return the Equipment at the end of the Rental Period, but will continue to be responsible for rental and other charges after the Rental Period if the Equipment is not returned in the condition required herein. If Sunbelt delivered the Equipment to Customer, Customer shall notify Sunbelt that the Equipment is ready to be picked up at the Site Address and obtain a Pick-Up Number, which Pick-Up Number Customer should keep as proof of the call; provided Customer remains liable for any loss, theft, damage to or destruction of the Equipment until Sunbelt confirms that the Equipment is returned in the condition required herein. Customer will not be charged the rental charges after the date the Pick-Up Number is given, provided Customer has otherwise complied with this Contract. No pickups occur on Sundays or statutory holidays and Saturday pickups are dependent on specific Store hours. If Customer picked up Equipment, Customer shall return Equipment to the same Store during that Store's normal business hours. If the Equipment is not returned by the estimated end of the Rental Period specified earlier, Customer agrees to pay the applicable rental rate for the Equipment until the end of the Rental Period.

14) **PURCHASES.** If this Contract identifies any Equipment, materials or other items that is to be purchased by Customer, Sunbelt sells and delivers such items to Customer on an **"AS IS, WHERE IS"** basis, with all faults and without any warranties (other than manufacturer warranties, if any) in consideration for Customer's payment to Sunbelt of the full purchase price of the item, Sunbelt retains title to the item until Customer has paid in full.

15) **DEFAULT.** Customer shall be in default if Sunbelt deems itself insecure or if Customer: (a) fails to pay sums when due; (b) breaches any Section of this Contract; (c) becomes a debtor in a bankruptcy proceeding, goes into receivership, takes protection from its creditors under any insolvency legislation, ceases to carry on business, or has its assets seized by any creditor; (d) fails to insure the Equipment as required, or otherwise places the Equipment at risk; (e) fails to return Equipment immediately upon Sunbelt's demand; or (f) is in default under any other contract with Sunbelt. If a Customer default occurs, Sunbelt shall have, in addition to all rights and remedies at law or in equity, the right to repossess the Equipment without judicial process or prior notice. Customer shall pay all of Sunbelt's costs, including reasonable costs of collection, court costs, attorneys and legal fees, incurred in exercising any of its rights or remedies herein. Sunbelt shall not be liable due to seizure of Equipment by order of governmental authority. **CUSTOMER WAIVES ANY RIGHT OF ACTION AGAINST SUNBELT ENTITIES FOR SUCH REPOSSESSION.**

16) **CRIMINAL WARNING.** The use of false identification to obtain Equipment or the failure to return Equipment by the end of the Rental Period may be considered theft, subject to criminal prosecution and civil liability where permitted, pursuant to applicable laws.

17) **ENVIRONMENTAL SERVICES CHARGE.** To promote a clean and sustainable environment, Sunbelt takes various measures to comply with applicable environmental regulations, as well as with Sunbelt's own policies. Sunbelt also incurs a wide range of environmental related expenses (both direct and indirect). These expenses may include services such as waste disposal, construction and maintenance of cleaning facilities, acquisition of more fuel-efficient equipment, as well as, labor costs, administration costs, etc. To help offset these and other costs, Sunbelt assesses an Environmental Services Charge, plus applicable taxes thereon in connection with certain rentals. The Environmental Services Charge is not a tax or governmentally mandated charge and is not designated for any particular use or placed in an escrow account, but is a charge that Sunbelt collects as revenue and uses at its discretion.

18) **FUEL.** For Equipment that uses fuel, Customer has three options: (a) Prepay Fuel Option - Customer may purchase a full tank of fuel for the Equipment at the start of the rental, in which case a "convenience charge" will appear on this Contract (calculated by multiplying the estimated fuel capacity of Equipment by the Prepay per gallon rate). As an added benefit, Customer may return the Equipment full of fuel and the convenience charge will be refunded (however, if not returned full, Customer will not obtain any credit for fuel left in the Equipment upon return); (b) Pay on Return Option - if Customer returns Equipment with less fuel than when received, Customer shall pay a refueling charge (calculated by multiplying gallons required to refill tank with fuel to level when received, by the Pay on Return per gallon rate); and (c) Return Full Option – if Customer returns the Equipment with at least as much fuel as when it was received (most Sunbelt Equipment comes with a full tank of fuel, but not all), no fuel charge will be assessed. The cost of Customer refueling Equipment itself will generally be lower than the Prepay Fuel Option or the Pay on Return Option; however these options each allow for the convenience of not refueling. Customer agrees that none of these options are a retail sale of fuel.

19) **LIMITATION OF SUNBELT'S LIABILITY. IN CONSIDERATION OF THE RENTAL OF EQUIPMENT, CUSTOMER AGREES THAT SUNBELT'S LIABILITY UNDER THIS CONTRACT, INCLUDING ANY LIABILITY ARISING FROM SUNBELT'S, SUNBELT ENTITIES, OR ANY THIRD PARTY'S COMPARATIVE, CONCURRENT, CONTRIBUTORY, PASSIVE OR ACTIVE NEGLIGENCE OR THAT ARISES AS A RESULT OF ANY STRICT OR ABSOLUTE LIABILITY, SHALL NOT EXCEED THE TOTAL RENTAL CHARGES PAID BY CUSTOMER UNDER THIS CONTRACT.**

20) **JURY TRIAL WAIVER. IN ANY DISPUTE ARISING OUT OF, IN CONNECTION WITH, OR IN ANY WAY PERTAINING TO THIS CONTRACT, CUSTOMER AND SUNBELT HEREBY KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVE ANY RIGHT TO A TRIAL BY JURY, THIS WAIVER BEING A MATERIAL INDUCEMENT TO ENTERING INTO THIS CONTRACT.**

21) **ARBITRATION AGREEMENT & CLASS ACTION WAIVER. AT THE ELECTION OF CUSTOMER OR SUNBELT, ANY DISPUTE ARISING OUT OF, IN CONNECTION WITH OR IN ANY WAY PERTAINING TO THIS CONTRACT SHALL BE SETTLED BY ARBITRATION BROUGHT IN THE PARTY'S INDIVIDUAL CAPACITY AND NOT AS A PLAINTIFF IN A PURPORTED CLASS OR REPRESENTATIVE CAPACITY, ADMINISTERED BY THE AMERICAN ARBITRATION ASSOCIATION UNDER ITS COMMERCIAL ARBITRATION RULES OR BY JAMS PURSUANT TO ITS STREAMLINED ARBITRATION RULES AND PROCEDURES AND JUDGEMENT ON THE AWARD RENDERED BY THE ARBITRATOR(S) MAY BE ENTERED IN ANY COURT HAVING JURISDICTION THEREOF. THERE SHALL BE NO RIGHT OR AUTHORITY FOR ANY CLAIMS TO BE ARBITRATED OR TRIED ON A CLASS ACTION BASIS.**

22) **COMPLIANCE WITH EXPORT AND IMPORT LAWS.** Removal of the Equipment from the United States ("U.S.") is prohibited under this Contract. If Customer desires or causes the transport and/or operation of the Equipment outside of the U.S., Customer must (a) obtain Sunbelt's consent prior to taking such action, including approval of established customs broker, and (b) execute an amendment to this Contract, which amendment is incorporated herein. If Customer exports or re-exports without complying with the above sentence, Customer agrees that (i) the Equipment is subject to and must comply with all applicable export laws, including but not limited to the Export Administration Regulations; and (ii) Customer, as the exporter/importer of record, is responsible for: (A) determining whether and obtaining if necessary, export or re-export licenses or other authorizations as required prior to exporting or re-exporting the Equipment, (B) obtaining any required documentation necessary for return of the Equipment, and (C) ensuring no unauthorized transfers or diversions of the Equipment occur. Refer to www.bis.doc.gov for information.

23) **COLLECTION OF DATA.** Customer consents to the collection, use and disclosure of the data and information Customer voluntarily provides to Sunbelt, including personal identifiable information and financial information, as well as the Telematics Data collected from the Equipment, as described in our Privacy Policy found at www.sunbeltrentals.com/privacypolicy.

24) **GOVERNING LAW.** The Parties expressly and irrevocably agree: (a) this Contract, including any related tort claims, shall be governed by the laws of South Carolina, without regard to any conflicts of law principles and (b) if any Section of this Contract is prohibited by any law, such Section shall be ineffective to the extent of such prohibition without invalidating the remaining Sections.

25) **FORCE MAJEURE.** Sunbelt shall not be liable or responsible to the Customer, nor be deemed to have defaulted under or breached this Contract, for any failure or delay in fulfilling or performing any term of this Contract when and to the extent such failure or delay is caused by or results from acts beyond Sunbelt's control, including, without limitation, the following force majeure events ("Force Majeure Event(s)"): (a) acts of God; (b) flood, fire, earthquake, epidemics, pandemics or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot or other civil unrest; (d) government order, law, regulations, shutdowns, or actions; (e) embargoes or blockades in effect on or after the date of this Contract; (f) national or regional emergency; (g) strikes, labor stoppages or slowdowns, or other industrial disturbances; (h) shortage of adequate power or transportation facilities; and (i) other events beyond the control of Sunbelt.

26) **MISCELLANEOUS.** This Contract, together with any Customer executed commercial credit application, if any, constitutes the entire agreement of the Parties regarding the Equipment and may not be modified except by written amendment signed by the Parties. Any reference in Customer's purchase order or other Customer document to other terms that shall control this transaction shall be void. This Contract benefits solely the Parties and their respective permitted successors and assigns and nothing in this Contract, express or implied, confers on any other person any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of this Contract. Customer's obligations hereunder shall survive the termination of this Contract. If any term is invalid, illegal, or unenforceable, such invalidity, illegality, or unenforceability shall not affect any other term or invalidate or render unenforceable such term. This Contract and all of Customer's rights in and to the Equipment are subordinate to all rights, title and interest of all persons (including Sunbelt's lenders) who have rights in the Equipment. Headings are for convenience only. To the extent that any terms in this Contract conflict, the Parties agree that the more specific terms control. A copy of this Contract shall be valid as the original. Any failure by Sunbelt to insist upon strict performance of any Section of this Contract shall not be construed as a waiver of the right to demand strict performance in the future. Customer and the person signing this Contract agree, represent and warrant that: (a) the person executing is 18 or the legal age of majority in the state, whichever is greater and they both have full authority to execute, deliver and perform this Contract; and (b) this Contract constitutes a legal, valid and binding obligation of Customer, enforceable in accordance with its terms. If the Parties have a fully executed, active agreement, intended to govern over conflicting terms and conditions, such agreement shall take precedence over the terms herein.

Additional terms and conditions for Shoring can be found at https://www.sunbeltrentals.com/about/shoring-bridging-additional-terms-and-conditions/

Rev Date 06/16/2021

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **24**
Date: 1/16/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
REMOVE FLOR SINK/INSALL JANITORS SINK

$662.10

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 1/22/2025 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

COST TO REMOVE FLOOR SINK AND INSTALL JANITOR 'S SINK PER CITY AND FLORIDA CODE .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$662.10
The new Contract Amount including this Change Order will be	$2,909,308.62

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

1/16/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 24
Date: 1/16/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: REMOVE FLOOR SINK AND INSTALL JAMITOR'S SINK

Reason: Design Omission

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED 1/22/2025 IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

COST TO REMOVE FLOOR SINK AND INSTALL JANITOR 'S SINK PER CITY AND FLORIDA CODE.

Description		Price
DAB MECHANICAL		$424.80
SINK AND FAUCET		$159.43
GC FEE 10%		$58.42
GENERAL LIABILITY 1.33%		$7.77
BOND FEE 2%		$11.68
	Subtotal:	$662.10
	Total:	**$662.10**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

REQUEST FOR CHANGE ORDER

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O# J-623-3

PROPOSAL SUBMITTED TO:	PHONE:	DATE:
AHRENS COMPANIES	561-361-6700	1/10/2025
STREET:	JOB NAME:	
1461 KINETIC ROAD	CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:	JOB:	
LAKE PARK, FL 33403	REMOVING MOP SINK	
ARCHITECT: DATE OF PLANS:	JOB PHONE:	

INCLUSION:

1.	1	3"	PVC COUPLING	$	3.83
2.	1	3"X2"	PVC BUSHING	$	4.58
3.	1	2"	PVC SWEEP	$	3.33
4.	2	2"	PVC COUPLING	$	5.00
5.	1	2"X1-1/2"	PVC SAN TEE	$	5.51
6.	1	1-1/2"	PVC 90º	$	2.30
7.	1	1-1/2"	PVC TEST CAP	$	1.00
8.	3'	2"	PVC SCH 40 PIPE	$	3.00
9.	2'	1-1/2"	PVC SCH 40 PIPE	$	1.80
10.	1	QT CAN	GLUE	$	19.88
11.	1	QT CAN	CLEANER	$	18.40
12.	2	1/2"	PP COUPLING	$	7.00
13.	2	1/2"	PP MALE ADAPTER	$	10.20
14.	4	1/2"	PP 90º	$	18.00
15.	2	1/2"	PP HARD CAP	$	6.20
16.	4	1/2"	PP 45º	$	8.00
17.	3'	1/2"	COPPER PIPE	$	9.00
18.	2	1/2"	COMP ANGLE STOP 1/4 TURN ANGLE STOP	$	18.30
19.	2	1/2"	ESCH	$	1.00
20.	1	1-1/2"	ESCH	$	1.00

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

CONTINUE TO NEXT PAGE Dollars $0.00

Payment to be made as follows:

Authorized
Signature: _____

Date:

REQUEST FOR CHANGE ORDER

DAB MECHANICAL INC.
"A LITTLE DAB WILL DO YA"
1717 SW 1ST WAY, SUITE 27
DEERFIELD BEACH, FLORIDA 33441
954-480-2690 FAX 954-480-9534

C/O# J-623-3

PROPOSAL SUBMITTED TO:	PHONE:	DATE:
AHRENS COMPANIES	561-361-6700	1/10/2025
STREET:	JOB NAME:	
1461 KINETIC ROAD	CRA BUILDING AT 95TH	
CITY, STATE and ZIPCODE:	JOB:	
LAKE PARK, FL 33403	REMOVING MOP SINK	
ARCHITECT: DATE OF PLANS:	JOB PHONE:	

INCLUSION CONT':

21.	2		LAV SUPPLY SS FLEX	$	42.30
22.	1	1-1/2"	P-TRAP	$	28.10
23.	1	1-1/2"	FLANGE TAIL PIECE	$	9.11
24.	4	1-1/4"	TAPCON	$	4.00
25.	4	1/4"	FENDER WASHER	$	0.80
26.	1	METAL	SAW ALL BLADE	$	9.75
				$	241.39

CREDIT:

1.	1	MOP SINK	$	(271.53)
2.	1	FAUCET	$	(110.93)
			$	(382.46)

LABOR:

1.	JOURNEYMAN	$75.00 X 8 HOURS	$	600.00

CREDIT FOR LABOR:

1.	JOURNEYMAN	$75.00 X 3 HOURS	$	(225.00)
RESTOCKING FEE 35%		FOR MOP SINK & FAUCET	$	133.86
OVERHEAD 10%			$	36.78
PROFIT 5%			$	20.23
			$	424.80

NOTE:

1. LAUNDRY TRAY AND FAUCET BY OTHERS.
2. ALL PATCHING OF CONCRETE BY OTHERS.

We Propose here by to furnish material and labor - complete in accordance with above specifications, for the sum of:

FOUR HUNDRED TWENTY-FOUR 80/100 Dollars $424.80

Payment to be made as follows:

Order Summary

Item Subtotal (1) $149.00

Pickup (1)

Project Source 18-in x 24-in 1-Basin White Freestanding Utility Tub with ... $149.00

Qty: 1

Estimated Tax $10.43

Promo Code

Estimated Total **$159.43**

Place Order

By placing an order, I agree to Lowe's Terms and Privacy Statement

Project Source 18-in x 24-in 1-Basin White Freestanding Utility Tub with Drain and Faucet

Item #5286851 | Model #999-LUT18WHT

$149.00

Manufacturer Color/Finish: White

Width (Inches): 18

18 | 24 | 30

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **25**
Date: 2/20/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
LANDSCAPING PERMIT FEES

$605.55

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/25** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

PERMIT FEES FOR DRAWING REV#5 S30 AND S31

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$605.55
The new Contract Amount including this Change Order will be	$2,909,252.07

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

2/20/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 25
Date: 2/20/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: LANDSCAPING PERMIT FEES

Reason: Design Change

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/25** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

PERMIT FEES FOR DRAWING REV#5 S30 AND S31

Description	Price
PERMIT FEES - A BETTER LANDSCAPING	$207.00
REVISION FEE	$75.00
REVISED DRAWINGS REV#5 S30 & S31	$152.00
REVISION FEE	$100.00
GC FEE 10%	$53.40
GENERAL LIBILITY 1.4%	$7.47
BOND FEE 2%	$10.68
Subtotal:	$605.55
Total:	**$605.55**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

LAKE PARK, FL 33043-1911

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMO	DEDUCTION	125650 BALANCE
		CITY OF DELRAY BEACH			
12-06-24	22-201687	PERMIT REVISION FEE	75.00	.00	75.00

CHECK DATE	12-06-24	CHECK NUMBER	125650	TOTALS	75.00	.00	75.00

71880-0

PLEASE DETACH THIS PORTION AND RETAIN FOR YOUR RECORDS.

WARNING - THIS CHECK IS PROTECTED BY SPECIAL SECURITY FEATURES

AHRENS COMPANIES
1461 KINETIC ROAD
LAKE PARK, FL 33403-1911
(561) 863-9004

TRUIST BANK 63-9138/2631

125650

Pay: **********Seventy-five dollars and no cents

DATE	CHECK NO.	AMOUNT
December 6, 2024	125650	$*********75.00

PAY TO THE ORDER OF
CITY OF DELRAY BEACH
100 NW 1ST AVENUE
DELARY BEACH, DFL 33444

AUTHORIZED SIGNATURE

SECURITY FEATURES INCLUDE MICROPRINTING • VOID PANTOGRAPH • ENDORSEMENT BACKER • BROWNSTAIN CHEMICAL REACTANT

⑈125650⑈ ⑆263191387⑆ 1000005501221⑈

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DEDUCTION	BALANCE
		CITY OF DELRAY BEACH			
12-06-24	22-201687	PERMIT REVISION FEE	75.00	.00	75.00

CHECK DATE	12-06-24	CHECK NUMBER	125650	TOTALS	75.00	.00	75.00

AHRENS COMPANIES
LAKE PARK, FL 33043-1911

12565

A Better Landscape Company

PROPOSAL CHANGE ORDER

No: 02

TO: Ahrens

Date: Jan 15, 2025

PROJECT: 95 SW 5th Ave. Delray Beach CRA

DESCRIPTION: Irrigation Permit Fee

Item #	Description	Qty	Unit Price	Net Amount
1	Irrigation permit fee	1	$132.00	$132.00
2	Processing	1	$75.00	75.00

Unit Cost:	$207.00
15% OHP:	Included
TOTAL:	$207.00

APPROVAL:

By: Tim Kellogg

Date: 1/15/2025

By:

Date:

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DEDUCTION
		CITY OF DELRAY BEACH		
-24-24	072424	DELRAY CRA	152.00	.C

Revised Drawings - Rack 5

5.30.331

CHECK DATE	7-26-24	CHECK NUMBER	125041	TOTALS	152.00	.

)-0

PLEASE DETACH THIS PORTION AND RETAIN FOR YOUR RECORDS.

City of Delray Beach Florida
*** CUSTOMER RECEIPT ***
Oper: KNIGHTS Type: OC Drawer: 1
Date: 7/30/24 00 Receipt no: 175694

Year	Number	Amount
2022	201687	

95 SW 5TH AVE
DELRAY BEACH, FL 33444
BP BUILDING PERMITS $152.00

Tender detail		
CK CHECK	125041	$152.00
Total tendered		$152.00
Total payment		$152.00

Trans date: 7/29/24 Time: 15:03:27

City of Delray Beach Flo
*** CUSTOMER RECEIPT *
Oper: KNIGHTS Type: OC
Date: 7/30/24 00 Receipt no

Year	Number
2022	201687

95 SW 5TH AVE
DELRAY BEACH, FL 33444
BP BUILDING PERMITS

Tender detail	
CK CHECK	125041
Total tendered	
Total payment	

Trans date: 7/29/24 Time

AHRENS COMPANIES
LAKE PARK, FL 33043-1911

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DE
		CITY OF DELRAY BEACH		
7-24-24	072424	DELRAY CRA	152.00	

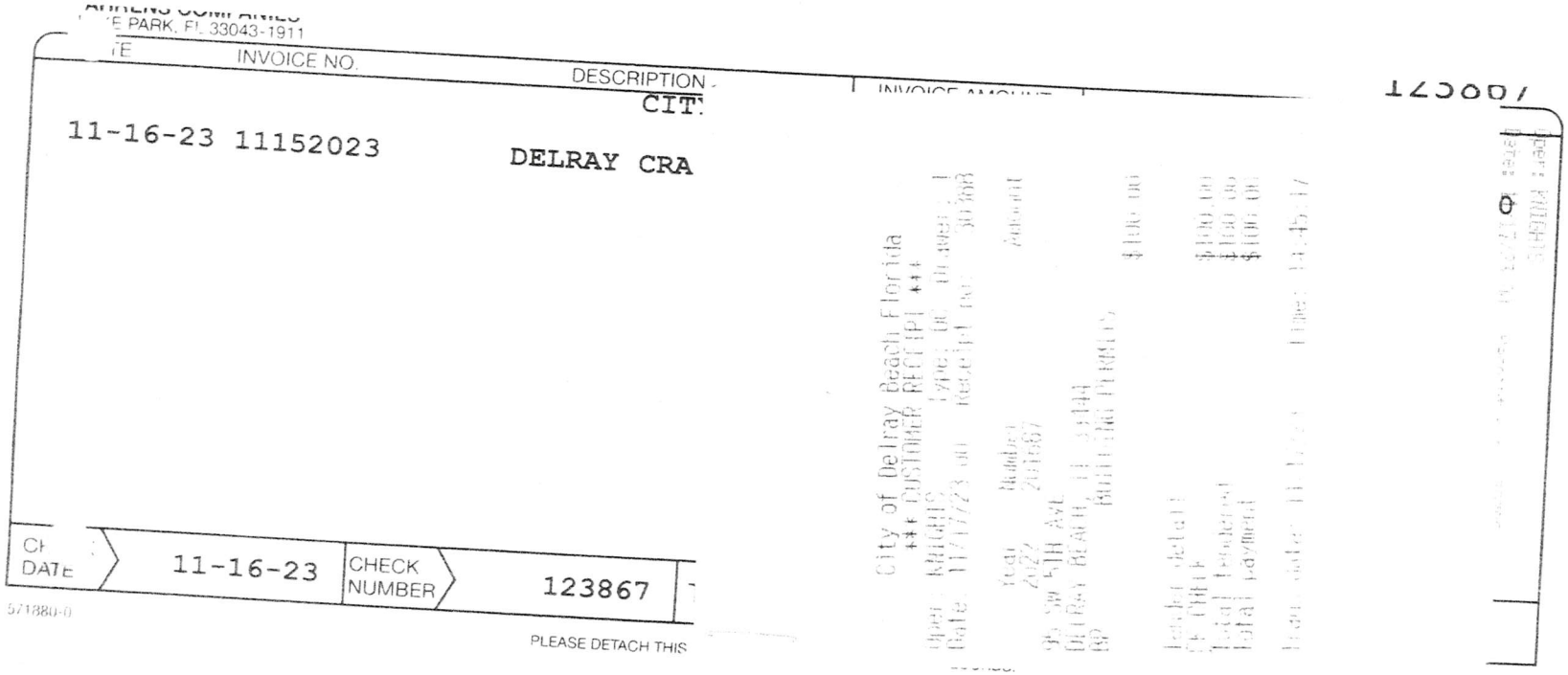
Revised Drawings - Rack 5

5.30.331

CHECK DATE	7-26-24	CHECK NUMBER	125041	TOTALS	152.00

571880-0

PLEASE DETACH THIS PORTION AND RETAIN FOR YOUR RECORDS



E PARK, FL 33043-1911

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT
11-16-23	11152023	CIT DELRAY CRA	

CHECK DATE	11-16-23	CHECK NUMBER	123867

571880-0

PLEASE DETACH THIS

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **27**
Date: 2/20/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SUPPLY (4) FORTIS 18401 WALL PACKS

$2,271.19

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

FORTIS 18401 WALL PACKS SUPPLIED - INSTALLATION INCLUDED IN ORIGINAL PRICE .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$2,271.19
The new Contract Amount including this Change Order will be	$2,910,917.71

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

2/20/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 27
Date: 2/20/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SUPUPLY (4) FORTIS 18401 WALL PACKS

Reason: Owner Request

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

FORTIS 18401 WALL PACKS SUPPLIED - INSTALLATION INCLUDED IN ORIGINAL PRICE .

Description		Price
(4) FORTIS 18401 WALL PACKS		$2,028.21
GC FEE 10%		$202.82
GENERAL LIABILITY 1.33%		$26.98
BOND FEE .65%		$13.18
	Subtotal:	$2,271.19
	Total:	**$2,271.19**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

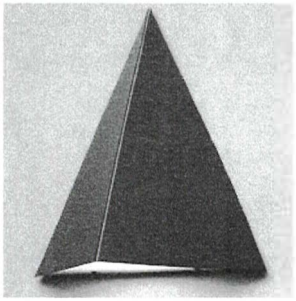
Approved by: _____

Date: _____

Lightology

CART

We're Here to Help (866) 954-4489

PRODUCT		PRICE	SHIPS IN	QTY		TOTAL PRICE
	**Fortis Pyramid Outdoor Wall Sconce by UltraLights** 18401-SS-OA-02 Smoked Silver / Opal Width: 12.5"	$473.88	**Usually ships in 31 days**	QTY	4	**$1,895.52** Remove

SAVE CART TO WISHLIST

Discount Code / Gift Card Number

To determine estimated sales tax and shipping costs, please enter the information below:

SHIP-TO COUNTRY

United States

Subtotal	**$1,895.52**
Sales Tax FL (7.00%)	**$132.69**
Shipping	**$0.00**
Order Total	**$2,028.21**
Amount Due	**$2,028.21**

SHIP-TO STATE

Florida

SHIP-TO ZIP CODE

33403

SHIPPING OPTION

UPS Ground ($0.00)

CHECKOUT

What happens after you place your order?

After your order is submitted, please check for an e-mail confirmation sent to the address connected to your Lightology account. Once your order is shipped, you will receive a second e-mail with tracking information so you know when to expect your package.

Products eligible for return/exchange include:

Items in original, new, uninstalled condition with all original parts, tags, and packaging. Restocking fees may apply. All returns must be pre-approved within 60 days of receipt and have a valid Return Number. 1 Year Warranty on all items Excluding Light Bulbs.

Products not eligible for return/exchange include:

Incandescent bulbs, custom / special orders, floor models, large orders (single fixtures over $5,000, or orders totaling over $5,000 on multiple quantities of the same fixture), overstock items, open box items and closeout items.

Please Inspect your Lightology order

Inspect your order Within 48 hours, or two business days of receiving your order. Lightology cannot be held responsible for any missing, or damaged goods if we are not notified within this time period.

↑ Back to top

Lightology

lightology.com
866-954-4489
02-11-25

Project:

Company:

Location: Fixture Type:

SPEC #: **ULT876904**

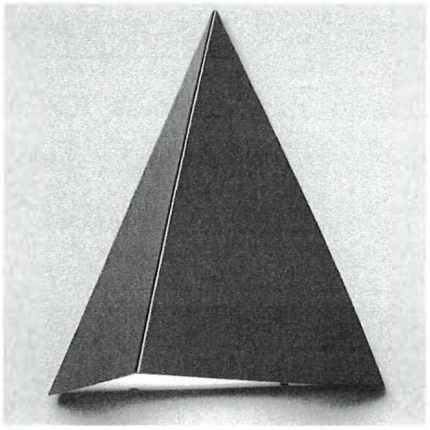
Approved On: Approved By:

Fortis Pyramid Outdoor Wall Sconce

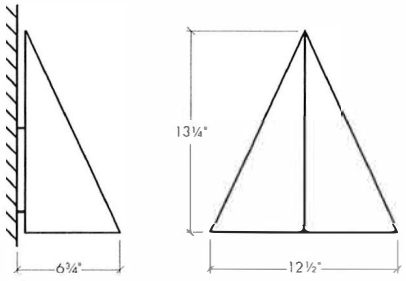
By UltraLights

Description

The Fortis Pyramid Outdoor Wall Sconce brings a simple clean look to a variety exterior spaces. The pyramid shaped housing directs light down through the Opal acrylic diffuser. Wet location rated. UL listed. Made in the USA.



Shown in black / opal



Specifications

COLOR	Opal
BODY FINISH	Black Pearl
WATTAGE	8.4W
DIMMER	Low Voltage Electronic
DIMENSIONS	12.5"W x 13.25"H x 6.75"D
INTEGRATED LED MODULE	1 x LED/8.4W/120-277V LED
COUNTRY OF ORIGIN	United States

Technical Information

LAMP COLOR	3000K
LUMENS/WATT	281.19
LUMINOUS FLUX	2362 lumens

CLICK TO VIEW PRODUCT

Notes:

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: 28
Date: 2/20/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
ELEVATOR STORAGE FEES

$6,310.08

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

ELEVATOR STORAGE FEES - TK ELEVATOR REQUESTING STORAGE FEES .
ELEVATOR INSTALLATION DELAYED DUE TO DESIGN CHANGES TO FPL TRANSFORMER INSTALLATION .

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$6,310.08
The new Contract Amount including this Change Order will be	$2,914,956.60

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

2/20/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 28
Date: 2/20/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: ELEVATOR STORAGE FEES

Reason: Design Change

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

ELEVATOR STORAGE FEES - TK ELEVATOR REQUESTING STORAGE FEES .
ELEVATOR INSTALLATION DELAYED DUE TO DESIGN CHANGES TO FPL TRANSFORMER INSTALLATION .

Description	Price
ELEVATOR STORAGE FEES	$5,635.00
GC FEE 10%	$563.50
GENERAL LIABILITY 1.33%	$74.95
BOND FEE .65%	$36.63
Subtotal:	$6,310.08
Total:	**$6,310.08**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

Subcontract Change Order Request

Date: 09/19/2024

PROJECT NUMBER: 211288
CONTRACT DATE: 5/18/2023
CHANGE ORDER NUMBER: 1

PROJECT NAME: 95 SW 5TH AVE COMMERICAL BLDG
PROJECT ADDRESS: 95 SW 5TH AVENUE
DELRAY BEACH, FL, 33483

CONTRACTOR NAME: Ahrens Companies
CONTRACTOR ADDRESS: 1461 Kinetic Road
Lake Park, FL, 33403

SUBCONTRACTOR NAME: TK ELEVATOR CORPORATION
SUBCONTRACTOR ADDRESS: 7567 Central Industrial Drive
Riveria Beach, FL, 33404

This request for a formal Change Order is made for the above-referenced Contractor and specifically intends to modify and amend the work, price and/or terms set forth in above-referenced Subcontract as follows:

Elevator material storage through 9/19/24. 49 days of storage at $100 per day. Ahrens agrees to issue a formal change order to TK Elevator for the equipment storage before the material delivery will be scheduled.

The following costs are required to accomplish the above scope:

Material Cost Subtotal	$0.00
Labor Cost Subtotal	$0.00
Miscellaneous Cost Subtotal	$4,900.00
Digital Options Cost Subtotal	$0.00
SUBTOTAL	$4,900.00
15.000% OH&P	$735.00
Total Amount of this Change Order to be added to the contract price	$5,635.00

In the event of any conflict between the work, price and/or terms and conditions of the above-referenced Subcontract or prior change orders thereto and this Change Order, this Change Order shall be final. Please sign two (2) copies of this Change Order and return two (2) copies to TK Elevator. A fully executed copy of this Change Order will be returned to you for your files.

Signed Acceptance:

By signing this Change Order where indicated below, the Contractor's signatory hereby acknowledges (a) that the Contractor agrees to all of the terms and conditions contained herein, (b) that the signatory has the authorization necessary to bind the Contractor to agreements of this nature, and (c) that this form is valid and binding notwithstanding any conflicts with procedures and/or forms required by the original Subcontract referenced above which are deemed to have been waived.

This change order/notice scope of work requires the anticipated or current project schedule, and associated time frames, to be adjusted commensurate with the time necessary for the engineering, material procurement and additional labor. TK Elevator will provide a revised project schedule on expedited schedule change order/notice scope of work to the purchaser upon request.

Subcontractor:
TK Elevator Corporation

Contractor:
Ahrens Companies

By: Chris Quarello
Title: NI Superintendent

Date: 09/19/2024

By: Mark Davidson
Title: PM

Date:

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **29**
Date: 2/21/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
BUILDERS RISK EXTENTIONS (1) 11/21/24 - 3/6/25 (2) 3/6/25 - 6/5/25

$19,407.00

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE , NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

BUILDERS RISK EXTENTIONS

11/21/2024 - 3/6/2025 = $10,180.80

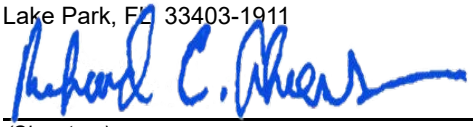
3/6/2025 - 6/5/2025 = $9,226.23

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$174,988.60
The Contract Amount prior to this Change Order was	$2,914,956.60
The Contract will be changed by this Change Order in the amount of	$19,407.00
The new Contract Amount including this Change Order will be	$2,934,363.60

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER . CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911



(Signature)

Richard C. Ahrens, CEO/President

By

2/21/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 29
Date: 2/21/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: BUILDERSRIAK EXTENTION (1) 11/21/24 - 3/6/25 (2) 3/6/25 - 6/5/25

Reason: Unforeseen Condition

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **2/27/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

BUILDERS RISK EXTENTIONS

11/21/2024 - 3/6/2025 = $10,180.80

3/6/2025 - 6/5/2025 = $9,226.23

Description	Price
BUILDERS RISL EXTENTIONS	$19,407.00
Subtotal:	$19,407.00
Total:	**$19,407.00**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

ACRISURE

Acrisure Southeast Partners Insurance Services, LLC

Invoice #	Date
36928	11/15/2024
Account Number	**Amount Due**
AHREENT-02	$10,180.80

Pay Online at: www.Acrisure.com/Southeast-Pay/

Make checks payable and remit to:

Acrisure Southeast Partners Insurance Services, LLC

Acrisure Southeast Trust
P.O. Box 738516
Dallas, TX 75373-8516

For Overnight and courier payments remit to:

J.P. Morgan – Lockbox Processing – TX1-0029
Acrisure Southeast Trust & 738516
14800 Frye Road
Fort Worth, Texas 76155

Ahrens Enterprises, Inc.
1461 Kinetic Road
Lake Park, FL 33403

Detach and return top portion with check payment. Please include invoice number on check memo line.

Invoice #	Account Number	Date	Amount Due
36928	AHREENT-02	6/4/2024	$10,180.80

Builders Risk **Policy Number: CSN0015754** **Effective:6/4/2024** **to 11/21/2024**

Item #	Policy Eff Date	Due Date	Trans	Description	Amount
469579	6/4/2024	11/15/2024	ENDT	ENDT - Extend Policy to 3/6/2025	$9,696.00
469580	6/4/2024	11/15/2024	SLTX	Surplus Lines Tax	$478.98
469581	6/4/2024	11/15/2024	STPF	Stamp Fee	$5.82

Total Invoice Balance: **$10,180.80**

Account Name: Ahrens Enterprises, Inc. dba Ahrens Compani

Pay Now

12577

ACRISURE®

Thank you for your payment of $10,183.80

A receipt for payment has been sent to JAHRENS@AHRENSCOMPANIES.COM for your records. Below is a summary of your payment.

Payment Summary

Invoice 36928	
ENDT - Extend Policy to 3/6/2025	$9,696.00
Surplus Lines Tax	$478.98
Stamp Fee	$5.82
Subtotal	$10,180.80
Convenience Fee	$3.00

ACRISURE

Acrisure Southeast Partners Insurance Services, LLC

Invoice #	Date
54819	2/21/2025
Account Number	**Amount Due**
AHREENT-02	$9,223.20

Pay Online at: www.Acrisure.com/Southeast-Pay/

Make checks payable and remit to:
Acrisure Southeast Partners Insurance Services, LLC
P.O. Box 738516
Dallas, TX 75373-8516

For Overnight and courier payments remit to:
J.P. Morgan – Lockbox Processing – TX1-0029
Acrisure Southeast Trust & 738516
14800 Frye Road
Fort Worth, Texas 76155

Ahrens Enterprises, Inc.
1461 Kinetic Road
Lake Park, FL 33403

Detach and return top portion with check payment. Please include invoice number on check memo line.

Invoice #	Account Number	Date	Amount Due
54819	AHREENT-02	3/6/2025	$9,223.20

Builders Risk - Project Specific (NR) **Policy Number: CSN0015754** **Effective:3/6/2025** **to 6/5/2025**

Item #	Policy Eff Date	Due Date	Trans	Description	Amount
793906	3/6/2025	3/6/2025	ENDT	ENDT - TIV Increased to $2,908,647	$8,534.00
793907	3/6/2025	3/6/2025	CFEE	Admin Fee	$250.00
793908	3/6/2025	3/6/2025	SLTX	Surplus Lines Tax	$433.93
793909	3/6/2025	3/6/2025	STPF	Stamping Fee	$5.27

Total Invoice Balance: **$9,223.20**

PAID 2/21/25 +3.00 For Proc Fee

Posted 2/21/25 JAD

Account Name: **Ahrens Enterprises, Inc. dba Ahrens Compani**

Pay Now

ACRISURE®

Thank you for your payment of $9,226.20

A receipt for payment has been sent to JAHRENS@AHRENSCOMPANIES.COM for your records. Below is a summary of your payment.

Payment Summary

Invoice 54819	
ENDT - TIV Increased to $2,908,647	$8,534.00
Admin Fee	$250.00
Surplus Lines Tax	$433.93
Stamping Fee	$5.27
Subtotal	$9,223.20
Convenience Fee	$3.00

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **31**
Date: 3/23/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
TK ELEVATOR LABOR ESCALATION COST

$1,877.90

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **3.28.25**IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

TK ELEVATOR LABOR ESCALATION COST

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$1,877.90
The new Contract Amount including this Change Order will be	$2,910,524.42

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

3/23/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 31
Date: 3/23/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: TK ELEVATOR LABOR ESCALATION COST

Reason: Unforeseen Condition

Source: Other

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **3.28.25**IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

TK ELEVATOR LABOR ESCALATION COST

Description		Price
LABOR ESCALATION COST		$1,656.00
GC FEE 10%		$165.60
GENERAL LIABILITY 1.4%		$23.18
BOND FEE 2%		$33.12
	Subtotal:	$1,877.90
	Total:	**$1,877.90**

If you have any questions, please contact me at .

Submitted by: JIM GRAVELINE, AHRENS COMPANIE

Approved by: _____

Date: _____

Subcontract Change Order Request

Date: 02/07/2025

PROJECT NUMBER:	211288
CONTRACT DATE:	5/18/2023
CHANGE ORDER NUMBER:	2
PROJECT NAME:	95 SW 5TH AVE COMMERICAL BLDG
PROJECT ADDRESS:	95 SW 5TH AVENUE DELRAY BEACH, FL, 33483
CONTRACTOR NAME:	Ahrens Companies
CONTRACTOR ADDRESS:	1461 Kinetic Road Lake Park, FL, 33403
SUBCONTRACTOR NAME:	TK ELEVATOR CORPORATION
SUBCONTRACTOR ADDRESS:	7567 Central Industrial Drive Riveria Beach, FL, 33404

This request for a formal Change Order is made for the above-referenced Contractor and specifically intends to modify and amend the work, price and/or terms set forth in above-referenced Subcontract as follows:

Cost for labor escalation clause in contract. Clause provides that if work is not complete by 12-31-24 an additional $1,440 will be added to contract. $16/hr X's 90hrs. Ahrens Companies agrees to issue a formal change order to TK Elevator for the above described work before any associated labor will be scheduled.

The following costs are required to accomplish the above scope:

Material Cost Subtotal	$0.00
Labor Cost Subtotal	$1,440.00
Miscellaneous Cost Subtotal	$0.00
Digital Options Cost Subtotal	$0.00
SUBTOTAL	$1,440.00
15.000% OH&P	$216.00
Total Amount of this Change Order to be added to the contract price	$1,656.00

In the event of any conflict between the work, price and/or terms and conditions of the above-referenced Subcontract or prior change orders thereto and this Change Order, this Change Order shall be final. Please sign two (2) copies of this Change Order and return two (2) copies to TK Elevator. A fully executed copy of this Change Order will be returned to you for your files.

Signed Acceptance:

By signing this Change Order where indicated below, the Contractor's signatory hereby acknowledges (a) that the Contractor agrees to all of the terms and conditions contained herein, (b) that the signatory has the authorization necessary to bind the Contractor to agreements of this nature, and (c) that this form is valid and binding notwithstanding any conflicts with procedures and/or forms required by the original Subcontract referenced above which are deemed to have been waived.

This change order/notice scope of work requires the anticipated or current project schedule, and associated time frames, to be adjusted commensurate with the time necessary for the engineering, material procurement and additional labor. TK Elevator will provide a revised project schedule on expedited schedule change order/notice scope of work to the purchaser upon request.

Subcontractor:
TK Elevator Corporation

Contractor:
Ahrens Companies

By: Brett Saunders Title: Superintendent	Date: 02/07/2025	By: Mark Davidson Title: PM	Date:

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822 Fax: (561) 863-9007

Change Order

Project:
22-000054 95 SW 5th AVENUE COMMERCIAL
BUILDING CONSTRUCTION (CRA)
DELRAY BEACH, FL 33444

Change Order: **33**
Date: 4/11/2025

To Contractor:
AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911

The Contract is changed as follows:
SUPPLY 3 CONCRETE PLANTERS FOR LARGE TREES AT WEST ELEVATION

$6,339.06

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **4/22/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY 3 CONCRETE PLANTERS FOR LARGE TREES @ WEST ELEVATION $7,590.00
ALLOWANCE CREDIT ($2,000.00)

The original Contract Amount was	$2,739,968.00
Net change by previously authorized Change Orders	$168,678.52
The Contract Amount prior to this Change Order was	$2,908,646.52
The Contract will be changed by this Change Order in the amount of	$6,339.06
The new Contract Amount including this Change Order will be	$2,914,985.58

The Contract Time will be unchanged.
The date of Substantial Completion as of the date of this Change Order therefore is

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND OWNER. CHANGE REQUEST/CHANGE ORDER VOID IF NOT SIGNED WITHIN 30 DAYS

AHRENS COMPANIES
CONTRACTOR
1461 Kinetic Road
Lake Park, FL 33403-1911

(Signature)

Richard C. Ahrens, CEO/President

By

4/11/2025

Date

OWNER

(Signature)

By

Date

AHRENS COMPANIES
1461 Kinetic Road
Lake Park, FL 33403-1911
Ph : (561) 839-2822

Change Request

To: IVAN CABRERA
DELRAY BEACH CRA
20 North Swinton Avenue
Delray Beach, Florida 33444
Delray Beach, FL 33444

Number: 33
Date: 4/11/25
Job: 22-000054 95 SW 5th AVENUE COMMERCIAL
Phone:

Description: SUPPLY 3 CONCRETE PLANTERS FOR LARGE TREES AT WEST ELEVATION

Reason: Field Condition

Initiated by: IVAN CABRERA (DELRAY BEACH CRA)

Source: RFI

We are pleased to offer the following specifications and pricing to make the following changes:

RECEIPT OF APPROVED CHANGE ORDER IS REQUIRED **4/22/2025** IN ORDER FOR AHRENS COMPANIES TO ISSUE THE REQUIRED CHANGE ORDERS AND SCHEDULE WORK. ONCE THE CHANGE ORDER IS RECEIVED BY AHRENS COMPANIES, THE START DATE WILL BE ESTABLISHED AND COMPLETION DAYS AS STATED BELOW . IF THE CHANGE ORDER IS RECEIVED AFTER THIS DATE, NOTIFICATION WILL BE PROVIDED ON POTENTIAL CONSTRUCTION SCHEDULE IMPACT AND CHARGES FOR ADDITINAL GENERAL CONDITIONS .

SUPPLY 3 CONCRETE PLANTERS FOR LARGE TREES @ WEST ELEVATION $7,590.00
ALLOWANCE CREDIT ($2,000.00)

Description		Price
SUPPLY 3 CONCRETE PLANTERS FOR LARGE TREES		$7,590.00
ALLOWANCE CREDIT		$-2,000.00
GENERAL CONDITION 10% ($5,590.00)		$559.00
GENERAL LIABILITY 1.4%		$78.26
BOND FEE 5%		$111.80
	Subtotal:	$6,339.06
	Total:	**$6,339.06**

If you have any questions, please contact me at (772)692-2300.

Submitted by: CHRIS CAPRIO
AHRENS ENTERPRISES, INC.

Approved by: _____
Date: _____

A Better Landscape Company

PROPOSAL CHANGE ORDER
No: 04

TO: Ahrens

Date: Feb. 22, 2025

PROJECT: 95 SW 5th Ave. Delray Beach CRA

DESCRIPTION: Supply three concrete planters for large trees at West Elevation

Item #	Description	Qty	Unit Price	Net Amount
1	Concrete planter 48"x 48"x 36" tall with natural finish Price includes tax & direct ship to jobsite	3	$1,900.00	$5,700.00
2	Drainage rock and clean fill	3	$100.00	$300.00
3	Labor to receive, unpack, and install in place. Install drainage rock and clean fill, prep for new planting.	1	$600.00	$600.00

Planters are figured with natural concrete finish and color. No painting, finishing or sealing.

No irrigation is figured. Owner to hand water as required for new planting.

One year warranty against manufactures defects. Does not cover abuse or damage by others.

50% deposit will be required, lead time is 4-6 weeks from receipt of deposit.

Unit Cost:	$6,600.00
15% OHP:	$990.00
TOTAL:	$7,590.00

APPROVAL:

By: Tim Kellogg

Date: 2/22/25

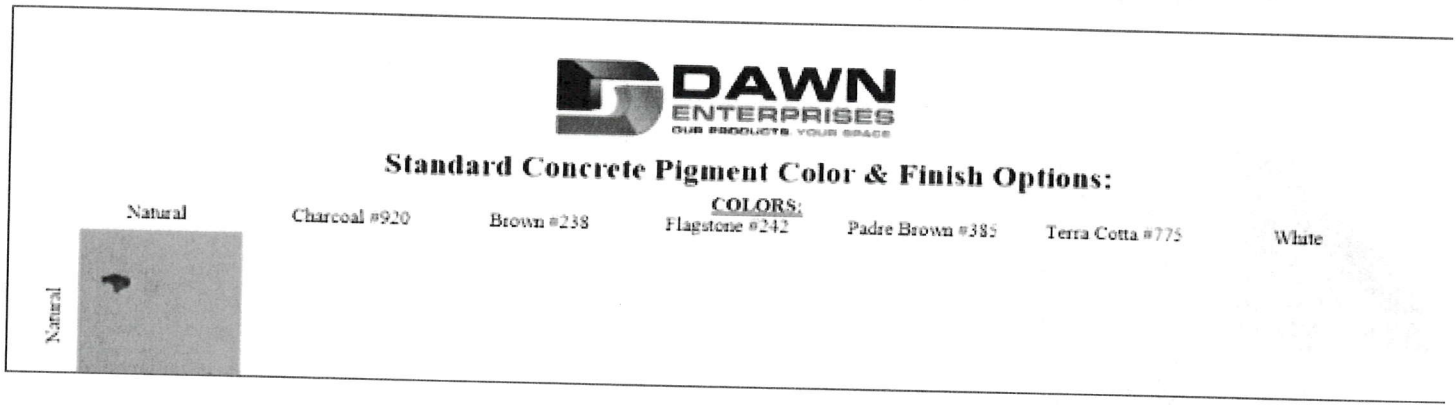
By:

Date:

Jupiter, FL 33458
Ofc: 561-741-2106

From: Jim Graveline <jgraveline@ahrenscompanies.com>
Sent: Thursday, March 20, 2025 8:41 AM
To: tim@abetterlandscapecompany.com
Cc: Brian Witt <bwitt@ahrenscompanies.com>; Lisa Panico <Lpanico@ahrenscompanies.com>
Subject: RE: Change Order 04 Concrete Planters

Tim,
That big expensive planter was approved, they want the natural color (below), I will get you this C/O



Thank you,

Jim Graveline
Project Manager

561-921-7567
561-863-9007
jgraveline@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403
ahrenscompanies.com

From: tim@abetterlandscapecompany.com <tim@abetterlandscapecompany.com>
Sent: Saturday, February 22, 2025 1:36 PM
To: Jim Graveline <jgraveline@ahrenscompanies.com>

Lisa Panico

From: Lisa Panico
Sent: Monday, March 31, 2025 10:41 AM
To: Chris Caprio
Cc: Shawn Ness; com-inbound-delray-beach-cra-development@procoretech.com
Subject: FW: Change Order 04 Concrete Planters

Gentlemen:

Please see below email string, these planters are very expensive and Jim was concerned about the sidewalks getting cracked. I gave this CO to Jim to give to Richard last week so we will discuss this tomorrow.

Lisa Panico
Project Coordinator

561-839-2825
561-863-9007
lpanico@ahrenscompanies.com
1461 Kinetic Road Lake Park, FL 33403
ahrenscompanies.com

The information contained in this message (including any attachments) may be privileged, proprietary, confidential and protected from disclosure. The information is intended to be for the use of the individual or entity designated above. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately and delete this message and all attachments from your computer and electronic devices.

From: tim@abetterlandscapecompany.com <tim@abetterlandscapecompany.com>
Sent: Monday, March 31, 2025 10:35 AM
To: Jim Graveline <jgraveline@ahrenscompanies.com>
Cc: Brian Witt <bwitt@ahrenscompanies.com>; Lisa Panico <Lpanico@ahrenscompanies.com>
Subject: RE: Change Order 04 Concrete Planters

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Jim,

Checking in with you for Change Order for the pots. Any word on that or the tree RFI?

Respectfully,
Tim Kellogg

A Better Landscape Company
1312 Commerce Lane, Ste 3C

Cc: Brian Witt <bwitt@ahrenscompanies.com>
Subject: Change Order 04 Concrete Planters

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Jim,

Please find Change Order 04 attached for concrete planters. As mentioned previously, we did not have any specifications provided to us so these are standard concrete planters with natural concrete color and finish. I've also attached specs from manufacture along with sample photos for similar products used. Call or email with any questions.

Respectfully,
Tim Kellogg

A Better Landscape Company
1312 Commerce Lane, Ste 3C
Jupiter, FL 33458
Ofc: 561-741-2106

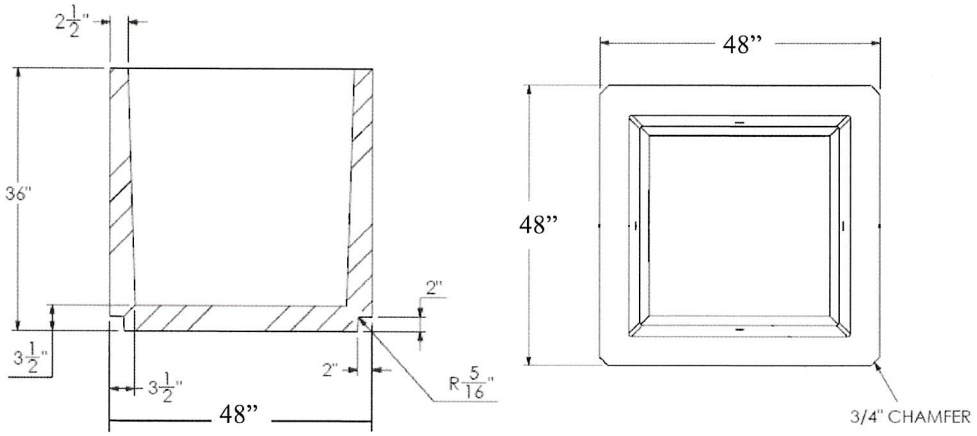
This email has been scanned for spam and viruses by Proofpoint Essentials. Click here to report this email as spam.

DAWN ENTERPRISES
OUR PRODUCTS. YOUR SPACE.

Specification Sheet

Model #: PC48x48x36S

48" sq x 36" tall Classic Series concrete planter



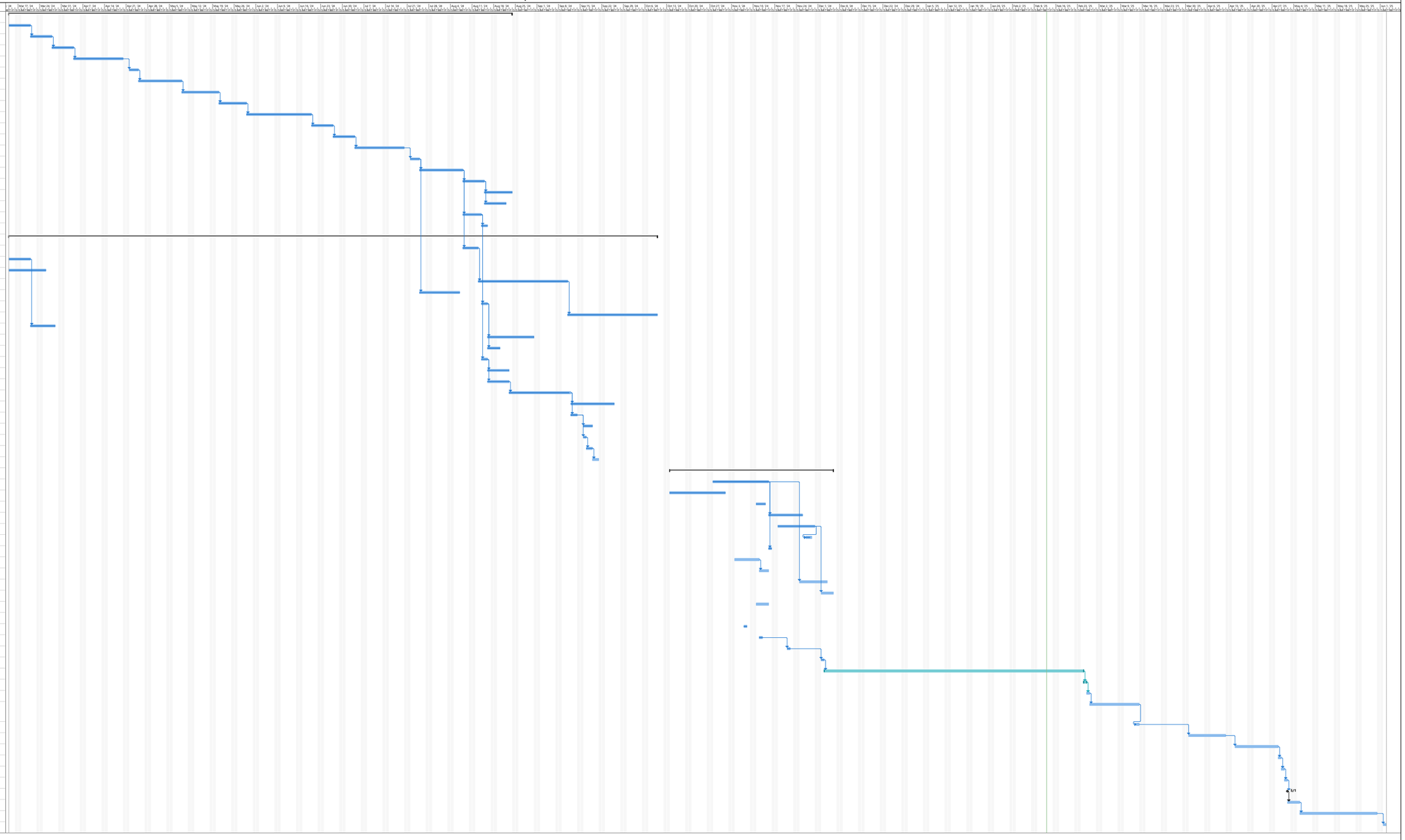
*Shown here in Padre Brown color and Con-tex finish.

Specifications:

- **Dimensions:** 48" sq x 36" tall with 2" tall x 2" deep toe kick at base.
- **Weight:** 2250 lbs
- **Materials:** 3/8" steel rebar, Type III Portland cement conforming to ASTM C150. All aggregate conforming to ASTM C33. All Steel Rebar conforming to ASTM – A 615. Due to the natural air entraining properties of Portland Type III cement, additional air entraining agents are not required. Air void content naturally occurring in a Type III Portland Cement mixture conforms to ASTM C457.
- **Stress Load:** Minimum 5000 PSI at 28 days
- **Color & Finish Options:** Please reference standard color/finish sheet.
- **Warranty:** One year warranty against manufacturer's defects.

Speculative Schedule 11.7.2024

ID	Task Name	Duration	Start	Finish	% Complete
1	**BUILDING STRUCTURE**	**117 days**	**Thu 3/14/24**	**Fri 8/23/24**	**100%**
2	Complete added column	5 days	Thu 3/14/24	Wed 3/20/24	100%
3	Install first floor precast	5 days	Thu 3/21/24	Wed 3/27/24	100%
4	Forms slab and beam sides	5 days	Thu 3/28/24	Wed 4/3/24	100%
5	Install rebar & MEP First floor slab	12 days	Thu 4/4/24	Fri 4/19/24	100%
6	Pour concrete first floor slab	3 days	Mon 4/22/24	Wed 4/24/24	100%
7	Slab Cure time	10 days	Thu 4/25/24	Wed 5/8/24	100%
8	Install second floor block	8 days	Thu 5/9/24	Mon 5/20/24	100%
9	Form and pour columns	7 days	Tue 5/21/24	Wed 5/29/24	100%
10	Form second floor concrete beams	15 days	Thu 5/30/24	Wed 6/19/24	100%
11	Install second floor Precast	5 days	Thu 6/20/24	Wed 6/26/24	100%
12	Form slab and beams	5 days	Thu 6/27/24	Wed 7/3/24	100%
13	Install rebar & MEP Second floor slab	12 days	Thu 7/4/24	Fri 7/19/24	100%
14	Pour concrete second floor slab	3 days	Mon 7/22/24	Wed 7/24/24	100%
15	Slab Cure time Roof	10 days	Thu 7/25/24	Wed 8/7/24	100%
16	Install roof block	5 days	Thu 8/8/24	Wed 8/14/24	100%
17	Form and pour elevator deck	7 days	Thu 8/15/24	Fri 8/23/24	100%
18	Form and pour roof parapet	5 days	Thu 8/15/24	Wed 8/21/24	100%
19	Remove precast shoring and forms	4 days	Thu 8/8/24	Tue 8/13/24	100%
20	Structure completed	2 days	Wed 8/14/24	Thu 8/15/24	100%
21	**Interior**	**150 days**	**Thu 3/14/24**	**Wed 10/9/24**	**98%**
22	Install roof MEP's	3 days	Thu 8/8/24	Mon 8/12/24	100%
23	Install roof Misc. wood framing	5 days	Thu 3/14/24	Wed 3/20/24	100%
24	Install A/C roof curbs	8 days	Thu 3/14/24	Mon 3/25/24	100%
25	Install roofing system	21 days	Tue 8/13/24	Tue 9/10/24	100%
26	Install interior stairs	9 days	Thu 7/25/24	Tue 8/6/24	100%
27	Install precast window sills	2 days	Wed 8/14/24	Thu 8/15/24	100%
28	Install roof top A/C units and Electric	21 days	Wed 9/11/24	Wed 10/9/24	100%
29	Install roof screening	6 days	Thu 3/21/24	Thu 3/28/24	100%
30	Install windows	11 days	Fri 8/16/24	Fri 8/30/24	100%
31	Install exterior metal doors	2 days	Fri 8/16/24	Mon 8/19/24	100%
32	Install interior metal studs and door frames	2 days	Wed 8/14/24	Thu 8/15/24	100%
33	Install Duct Work	5 days	Fri 8/16/24	Thu 8/22/24	100%
34	Install interior MEP rough	5 days	Fri 8/16/24	Thu 8/22/24	100%
35	Install and finish drywall	14 days	Fri 8/23/24	Wed 9/11/24	95%
36	Install ceramic Tile	10 days	Thu 9/12/24	Wed 9/25/24	100%
37	Prime drywall	2 days	Thu 9/12/24	Fri 9/13/24	100%
38	Install ceiling grid	3 days	Mon 9/16/24	Wed 9/18/24	100%
39	Install bathroom accessories and Partitions	1 day	Mon 9/16/24	Mon 9/16/24	100%
40	Finish coat of paint	2 days	Tue 9/17/24	Wed 9/18/24	100%
41	Install ceiling tiles	2 days	Thu 9/19/24	Fri 9/20/24	0%
42	**EXTERIOR WORK**	**39 days**	**Mon 10/14/24**	**Thu 12/5/24**	**67%**
43	Stucco building	14 days	Mon 10/28/24	Thu 11/14/24	100%
44	Install ceramic tile accents	14 days	Mon 10/14/24	Thu 10/31/24	100%
45	Install Accent Louvers	3 days	Mon 11/11/24	Wed 11/13/24	100%
46	Paint building exterior	7 days	Fri 11/15/24	Mon 11/25/24	100%
47	Install concrete walks	10 days	Mon 11/18/24	Fri 11/29/24	100%
48	Install handrails	2 days	Wed 11/27/24	Thu 11/28/24	55%
49	Install Canvas Canopy	1 day	Fri 11/15/24	Fri 11/15/24	100%
50	Install irrigation	6 days	Mon 11/4/24	Mon 11/11/24	0%
51	Install landscaping	3 days	Tue 11/12/24	Thu 11/14/24	0%
52	Install brick pavers	7 days	Mon 11/25/24	Tue 12/3/24	0%
53	Parking striping	4 days	Mon 12/2/24	Thu 12/5/24	0%
54	Patch asphalt road	4 days	Mon 11/11/24	Thu 11/14/24	0%
55					
56	FPL to install Pole	1 day	Thu 11/7/24	Thu 11/7/24	100%
57	Electrician to set pad	1 day	Tue 11/12/24	Tue 11/12/24	100%
58	FPL to set transformer	1 day	Thu 11/21/24	Thu 11/21/24	100%
59	FPL to run primaries	1 day	Mon 12/2/24	Mon 12/2/24	100%
60	Electrical Change order to Run Secomndaries	60 days	Tue 12/3/24	Mon 2/24/25	0%
61	Install Pull Box	1 day	Tue 2/25/25	Tue 2/25/25	0%
62	Electrician to run Secondaries	1 day	Wed 2/26/25	Wed 2/26/25	0%
63	Electrician to set up panel/call for electrical final	12 days	Thu 2/27/25	Fri 3/14/25	0%
64	Set Meter	1 day	Fri 3/14/25	Fri 3/14/25	0%
65	Install elevator	10 days	Mon 3/31/25	Fri 4/11/25	0%
66	Install elevator door frame,hang,Sand,Paint	10 days	Tue 4/15/25	Mon 4/28/25	0%
67	Elevator start up/Final	1 day	Tue 4/29/25	Tue 4/29/25	0%
68	Building final inspection	1 day	Wed 4/30/25	Wed 4/30/25	0%
69	Building certificate of Completion/TCO/COC	1 day	Thu 5/1/25	Thu 5/1/25	0%
70	Substantial Completion	0 days	Thu 5/1/25	Thu 5/1/25	0%
71	Building final cleaning	2 days	Fri 5/2/25	Mon 5/5/25	0%
72	Complete punch list	19 days	Tue 5/6/25	Fri 5/30/25	0%
73	Turn Building Over to Delray CRA	1 day	Mon 6/2/25	Mon 6/2/25	0%



Project: DELRAY CRA 02-13-20
Date: Thu 2/13/25

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Progress · Manual Progress