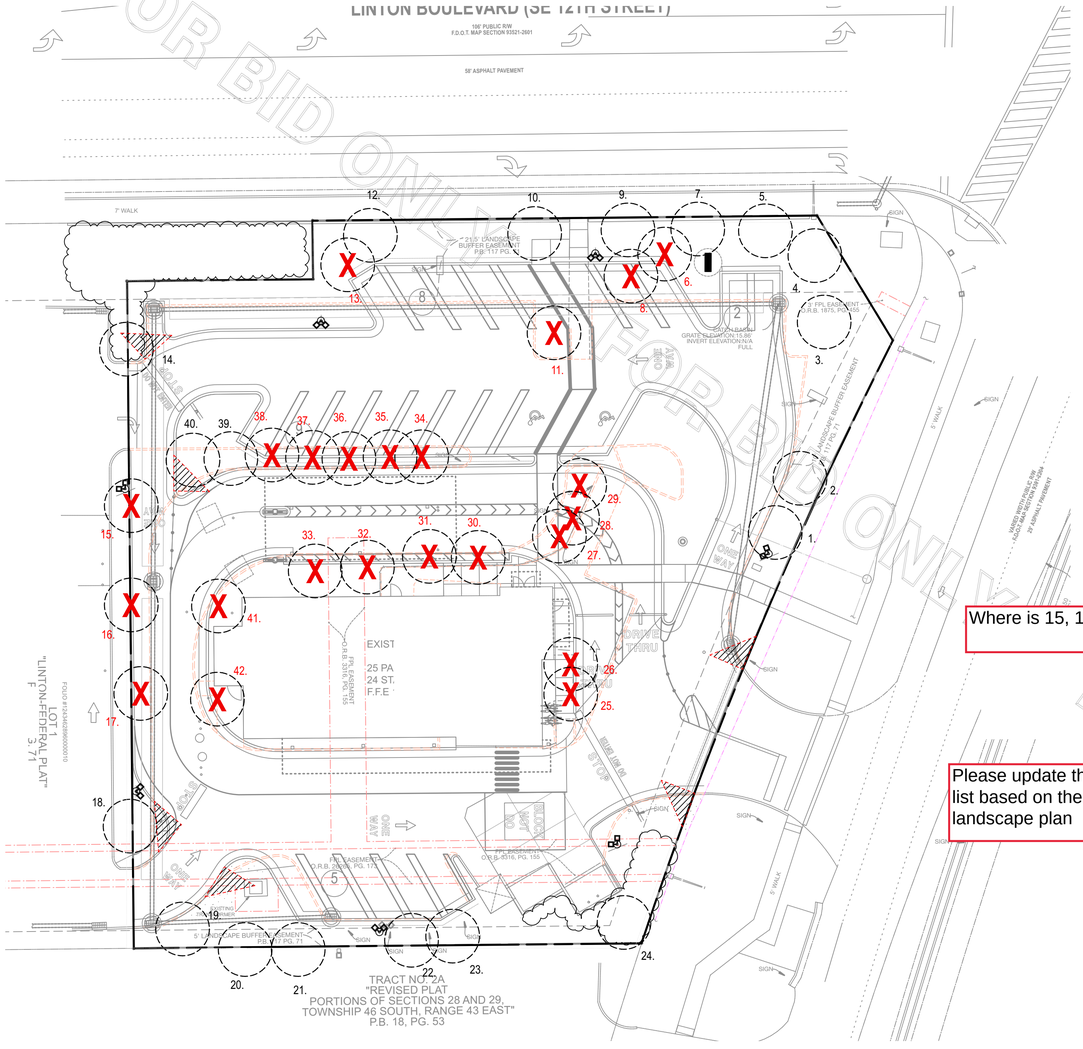

Tree Disposition and Mitigation

Project Address: 1800 S. FEDERAL HWY **Parcel ID** (for multiple IDs, use one for the common area):

Preserve

Tree #	Common Name	Scientific Name	Height	Spread	DBH	Condition Rating	Comments
4	East Palatka Holly	Ilex x attenuata 'East Palatka'			7.5"	Good	
14	Live Oak	Quercus virginiana			15.5"	Good	
19	Gumbo Limbo	Bursera simaruba			11"	Good	
20	Live Oak	Quercus virginiana			15"	Poor	
21	Live Oak	Quercus virginiana			13"	Poor	
22	Unidentified	Unidentified			13"	Poor	
23	Unidentified	Unidentified			10"	Poor	
Palm #	**Common Name**	**Scientific Name**	**Height**	**Spread**	**Clear Trunk**	**Condition Rating**	**Comments**
1	Foxtail Palm	Wodyetia bifurcata	15'	8'		Good	
2	Foxtail Palm	Wodyetia bifurcata	13'	8'		Good	
3	Royal Palm	Roystonea regia	23'	12'		Good	
5	Royal Palm	Roystonea regia	18'	10'		Good	
7	Royal Palm	Roystonea regia	18'	10'		Good	
9	Royal Palm	Roystonea regia	20'	12'		Good	
10	Royal Palm	Roystonea regia	20'	12'		Good	
12	Royal Palm	Roystonea regia	21'	12'		Good	
18	Foxtail Palm	Wodyetia bifurcata	12'	8'		Good	
24	Foxtail Palm	Wodyetia bifurcata	16'	9'		Good	
39	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	
40	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	

Relocation

Tree #	Common Name	Scientific Name	Height	Spread	DBH	Condition Rating	Comments
Palm #	**Common Name**	**Scientific Name**	**Height**	**Spread**	**Clear Trunk**	**Condition Rating**	**Comments**

Removal

Tree #	Common Name	Scientific Name	Height	Spread	DBH	Condition Rating < 50% Condition Rating ≥ 50%	Comments
6	East Palatka Holly	Ilex x attenuata 'East Palatka'			6.5"	Good	
8	East Palatka Holly	Ilex x attenuata 'East Palatka'			6.5"	Good	
11	Gumbo Limbo	Bursera simaruba			8.5"	Good	
13	East Palatka Holly	Ilex x attenuata 'East Palatka'			7"	Good	

Trees with Condition Rating < 50% to be Removed: **0 Trees**
Total DBHs of Trees with Condition Rating ≥ 50% to be Removed: **029 DBH inches / 4 of Trees**

Palm #	Common Name	Scientific Name	Height	Spread	Clear Trunk	Condition Rating < 50% Condition Rating ≥ 50%	Comments
25	Single Montgomery Palm	Veitchia montgomeryana 'Single'	25'	8'		Good	
26	Single Montgomery Palm	Veitchia montgomeryana 'Single'	25'	9'		Good	
27	Double Montgomery palm	Veitchia montgomeryana 'Double'	25'	10'		Good	
28	Double Montgomery palm	Veitchia montgomeryana 'Double'	27'	10'		Good	
29	Double Montgomery palm	Veitchia montgomeryana 'Double'	23'	10'		Good	
30	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	8'		Good	
31	Single Alexander Palm	Ptychosperma elegans 'Single'	12'	8'		Good	
32	Foxtail Palm	Wodyetia bifurcata	15'	10'		Good	
33	Foxtail Palm	Wodyetia bifurcata	16'	10'		Good	
34	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	8'		Good	
35	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	
36	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	
37	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	
38	Single Alexander Palm	Ptychosperma elegans 'Single'	20'	9'		Good	
41	Triple Christmas Palm	Adonidia merrillii 'Triple'	15'	10'		Good	
42	Triple Christmas Palm	Adonidia merrillii 'Triple'	16'	10'		Good	

Total Numbers of Palms with Condition Rating < 50% to be Removed: **0**
Total Heights of Palms with Condition Rating ≥ 50% to be Removed: **0 301 feet in height /16 of Palms**

Where is 15, 16 & 17?

Isn't it 318 ft?

Please update the list based on the final landscape plan

Mitigation

Tree Replacement Calculations*

New Trees	Caliper (CAL)	Calipers Provided
4 of Gumbo Limbo	4 X 5 (5 or 6) inch CAL	20 inch
1 of Buttonwood	1 X 5 (5 or 6) inch CAL	5 inch
7 of Holly	7 X 4 (5 or 6) inch CAL	28 inch

Replacement for Trees (Removed, Condition Rating ≥ 50%): **0 CAL / 12 of Trees**
Replacement for Tree-for-Tree basis: **0 12 Trees**

Palm Replacement Calculations**

New Palms	Overall Height	Clear Trunk
2 of Royal Palm	20'	12
9 of Foxtail Palm	18'	8
7 of Alexander Palm	16'	9

Replacement for Palms (Removed, Condition Rating ≥ 50%): **0 314 & 18 of Palms**
Replacement for Palm-for-Palm basis: **18 Palms**

Requirements of Vegetation Removal (Sec. 4.6.19 (E)(5)

***TREE**

*Staff recommends at least 4" CAL trees for mitigation as required.
Trees with condition rating of ≥ 50%: Total DBHs of trees shall be replaced with equivalent # of CAL inches of replacement trees.
Trees with condition rating of < 50%: Required to be mitigated on a tree-for-tree basis (16' DH X 6' ST X 8' CT X 7' SPH for others & 12' OH for SF & Duplex)

****Palm**

Palms with condition rating of ≥ 50%: Replaced with one palm of equal overall heights (OH) or 16 ft OH, whichever is greater
Palms with condition rating of < 50%: Required to be mitigated on a palm-for-palm basis (16' OH X 8 CT for others & 12' OH X 6' CT for SF & Duplex)

In Lieu Fee for TREE (Sec. 4.6.19 (E)(5)(d))

DBH 0 to 8"	$450
DBH 9" to 12"	$650
DBH 13" to 18"	$850
DBH 19" and greater	$1,000

Example: In-lieu-fee for a 21" DBH tree: ($450 × 8") + ($650 × 4") + ($850 × 6") + ($1,000 × 3") = $3,600 + $2,600 + $5,100 + $3,000 = $14,300

For trees with a condition rating of between 25 percent and 50 percent, the in-lieu fee shall be calculated at 50 percent of the above escalating scale.
Trees and palms with a condition < 50 % are exempt from DBH/caliper inch-for-inch replacement, but are required to be mitigated on a tree-for-tree or palm-for-palm basis.

In-lieu-fee for a palm: $75 per one foot grey trunk or clear trunk

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REGISTERED LANDSCAPE ARCHITECT
STEPHEN L MANLEY
LA 0666777
STATE OF FLORIDA

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FSU# 03146

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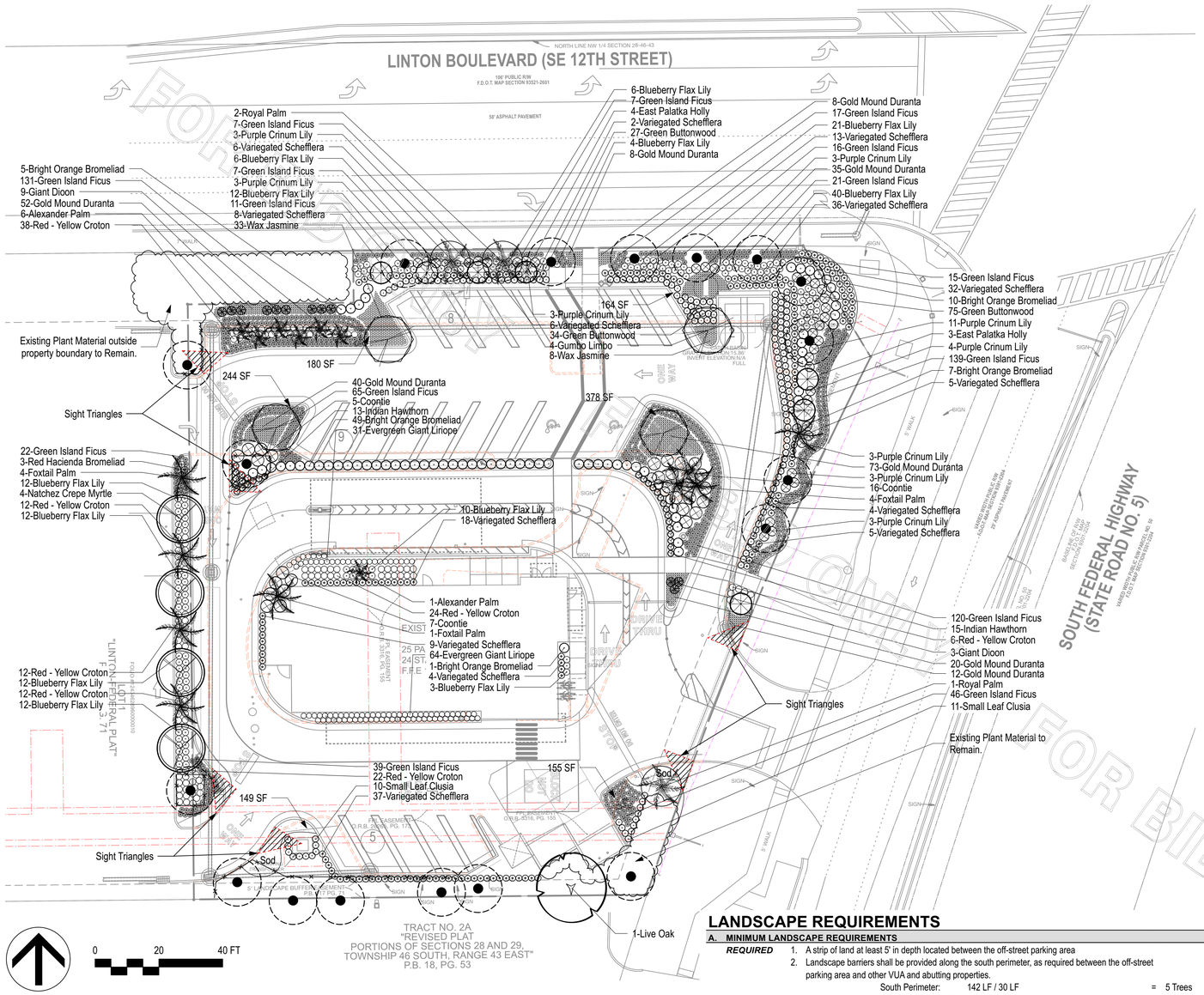
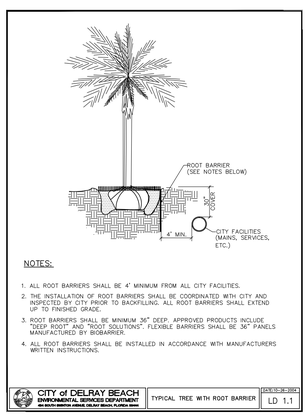
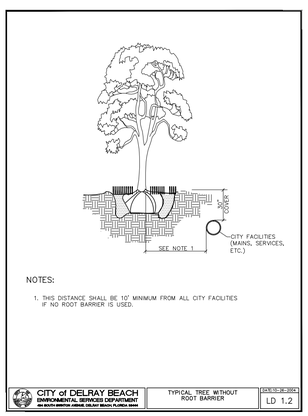
FOR BID

SHEET
Tree Mitigation Plan

SHEET NUMBER
L-100







LANDSCAPE REQUIREMENTS

A. MINIMUM LANDSCAPE REQUIREMENTS

REQUIRED

1. A strip of land at least 5' in depth located between the off-street parking area
2. Landscape barriers shall be provided along the south perimeter, as required between the off-street parking area and other VUA and abutting properties.
   South Perimeter: 142 LF / 30 LF = 5 Trees
3. Landscaping shall consist of 1 Tree per 30 LF or fraction thereof
   Linton Blvd.: 202 LF / 30 LF = 7 Trees
   South Federal Hwy.: 165 LF (Less Drive) / 30 LF = 6 Trees
4. A 24" hedge shall be placed along the interior perimeter of the landscape strip and attain a minimum height of 36" above finished grade within one year of planting.
5. Landscape strips that have a depth of 10' or greater shall be required to provide an addtional layer of groundcover, groundcover shall be installed one-half of the height of the required perimeter hedge.
6. Landscape barrier shall be provided between off-street parking area and abutting properties, landscape barrier may be 24" at time of planting and achieve and be maintained not less than 36" nor greater than 72" Hgt.
7. Interior Landscaping within off-street parking areas shall amount to no less than 10% of the total area used for parking and accessways
   Off-street parking area: 10,005 SF x 10% = 1,001 SF landscape area
8. There shall be a group of Palms or a shade tree for 125 SF of required interior landscaping, no more than 25% of required trees shall be Palms
   1,001 required landscape area / 125 SF = 8 Group of Palms or Trees
9. Landscape island which contain a minimum of 135 SF of planting area, with a dimension of 9' excluding curb shall contain 1 Shade Tree and 75 SF of Shrubs and Groundcover
10. No more than 50% of required trees shall be palms. 24 Required Trees @ 50% = ~~12~~ Palms Max
11. 50% of the 24 required trees and 25% of all other required plant materials shall be native

PROVIDED

1. A 5' Landscape strip is provided between the off-street parking area and ROW
2. South Perimeter: 4 Existing Trees, ~~1 Live Oak~~ = 5 Trees
3. Linton Blvd: 6 Existing Royal Palms, 2 Royal Palms = 8 ~~Trees~~ Royal Palms
   South Federal Hwy: 2 Existing Foxtail Palms, 1 Foxtail Palm (equals 1 Shade Tree), 1 Existing Royal Palm, ~~1 Royal Palm~~, 3 Hollies = 6 Trees
4. Green Button Hedge planted @ 24" Hgt, will be maintained at a hgt. of 36"
5. Additional layer of landscape is proposed, will be maintained at half the height.
6. Landscape barrier is proposed and will be maintained at a hgt. of 36"
7. 3,192 SF of interior landscape area provided.
8. 4 Gumbo Limbos, 4 Foxtail Palm, 1 Silver Buttonwood
9. 4 Gumbo Limbo, Shrubs and Groundcover
10. 7 Palms used towards req tree plantings: 5 Foxtail Palms, 2 Royal Palms
11. 71% of Trees are native, 47% of other required plant material is native

26 Trees (5, 7, 6, & 8)

Live Oak may not be suitable for the location

13 required trees can be substituted by palms

will be substituted by a small tree because of OHWs

I am not sure what 8, 9, and 10 are indicating

LANDSCAPE NOTES

SOUTHEAST

1. Landscape Contractor to read and understand the Landscape Specifications (sheet L-102) prior to finalizing bids. The Landscape Specifications shall be adhered to throughout the construction process.
2. Contractor is responsible for locating and protecting all underground utilities prior to digging.
3. Contractor is responsible for protecting existing trees from damage during construction.
4. All tree protection devices to be installed prior to the start of land disturbance, and maintained until final landscaping.
5. All tree protection areas to be protected from sedimentation.
6. All tree protection fencing to be inspected daily, and repaired or replaced as needed.
7. No parking, storage or other construction activities are to occur within tree protection areas.
8. All planting areas shall be cleaned of construction debris (ie. concrete, rock, rubble, building materials, etc) prior to adding and spreading of the topsoil.
9. General Contractor is responsible for adding a min of 4" clean friable topsoil in all planting beds and all grassed areas. Graded areas to be held down the appropriate elevation to account for topsoil depth. See Landscape Specifications for required topsoil characteristics.
10. In all parking lot islands, the General Contractor is responsible to remove all debris, fracture/loosen subgrade to a min. 24" depth. Add topsoil to a 6"-8" bermed height above island curbing; refer to landscape specifications and landscape island detail.
11. Prior to beginning work, the Landscape Contractor shall inspect the subgrade, general site conditions, verify elevations, utility locations, irrigation, approve topsoil provided by the General Contractor and observe the site conditions under which the work is to be done. Notify the General Contractor of any unsatisfactory conditions, work shall not proceed until such conditions have been corrected and are acceptable to the Landscape Contractor.
12. Any deviations from the approved set of plans are to be approved by the Landscape Architect.
13. Landscaping shall be installed in conformance with ANSI Z60.1 the "American Standard for Nursery Stock" and the accepted standards of the American Association of Nurserymen.
14. Existing grass in proposed planting areas shall be killed and removed. Hand rake to remove all rocks and debris larger than 1 inch in diameter, prior to adding topsoil and planting shrubs.
15. Soil to be tested to determine fertilizer and lime requirements prior to laying sod.
16. Annual and perennial beds: add min. 4 inch layer of organic material and till to a min. depth of 12 inches. Mulch annual and perennial beds with 2-3 inch depth of mini nuggets.
17. All shrubs beds (existing and new) to be mulched with a min. 3 inch layer of mulch (double shredded hardwood mulch).
18. Planting holes to be dug a minimum of twice the width of the root ball, for both shrub and tree. Set plant material 2-3" above finish grade. Backfill planting pit with topsoil and native excavated soil.
19. Sod to be delivered fresh (Cut less than 24 hours prior to arriving on site), laid immediately, rolled, and watered thoroughly immediately after planting. Edge of sod at planting beds are to be "V" trenched; see Landscape Details.
20. Any existing grass disturbed during construction to be fully removed, regraded and replaced. All tire marks and indentions to be repaired.
21. Water thoroughly twice in first 24 hours and apply mulch immediately.
22. The Landscape Contractor shall guarantee all plants installed for one full year from date of acceptance by the owner. All plants shall be alive and at a vigorous rate of growth at the end of the guarantee period. The Landscape Contractor shall not be responsible for acts of God or vandalism. See Landscape Specifications for Warranty requirements/expectations.
23. Any plant that is determined dead, in an unhealthy, unsightly condition, lost its shape due to dead branches, or other symptoms of poor, non-vigorous growth, shall be replaced by the Landscape Contractor. See Landscape Specifications for warranty requirements/expectations.
24. Site to be 100% irrigated in all planting beds and grass area by an automatic underground Irrigation System. See Irrigation Plan L-200 for design. Irrigation as-built shall be provided to the Landscape Architect within 24 hours of irrigation install completion.
25. Stake all evergreen and deciduous trees as shown in the planting detail and as per the Landscape Specifications.
26. Remove stakes and guying from all trees after one year from planting.

NOTE:

a. All plant material shall be Florida #1 grade or better. All material that is graded lower than Florida #1 quality shall be rejected.
b. Mulch should be initially applied at least a 2-3 inch depth but pulled away from direct contact with stems and trunks to avoid rotting. Mulched planting beds are an ideal replacement for turf areas.
c. All landscaped areas shall be provided with a fully automated sprinkler system that will provide complete coverage of all plant materials and grass to be maintained. All systems shall be designed to allow for head-to-head coverage (100% coverage with 100% overlap).

PLANT LIST

	Qty	Botanical Name	Common Name	Scheduled Size	Remarks
		Trees			
	4	Bursera simaruba	Gumbo Limbo	6" Cal.; 16' Ht. x 7' Spr.	8' Clear Trunk
	7	Ilex x attenuata 'East Palatka'	East Palatka Holly	6" Cal.; 16' Ht. x 7' Spr.	8' Clear Trunk
	4	Lagerstroemia indica 'Natchez'	Natchez Crepe Myrtle	6" Cal.; 16' Ht. x 7' Spr.	8' Clear Trunk
	1	Quercus virginiana	Live Oak	6" Cal.; 16' Ht. x 7' Spr.	8' Clear Trunk
		Palms			
	9	Wodyetia bifurcata	Foxtail Palm	18' Ht.	Min. 8' C.T.
	3	Roystonea regia	Royal Palm	20' Ht. Min.	Min. 8' C.T.
	7	Ptychosterma elegans	Alexander Palm	16' Ht. Min.	Triple Multi-Trunk, Min. 8' C.T.
		Shrubs			
	72	Aechmea blanchettiana	Bright Orange Bromeliad	36" Ht. x 24" Spr.	
	3	Aechmea hacienda	Red Hacienda Bromeliad	24" Ht. x 24" Spr.	
	21	Clusia guttifera	Small Leaf Clusia	60" Ht. x 24" Spr.	Plant 24" O.C.
	126	Codieaum variegatum 'Mammey'	Red - Yellow Croton	24" Hgt x 24" Spr.	Plant 24" O.C.
	136	Conocarpus erectus	Green Buttonwood	24" Hgt x 24" Spr.	Plant 24" O.C.
	36	Crinum augustum 'Queen Emma'	Purple Crinum Lily	36" Ht.	
	12	Dioon spinulosum	Giant Dioon	4'-5' O.A. Ht.	Full
	185	Schefflera arboricola 'Trinette'	Variegated Schefflera	36" Hgt. x 24" Spr.	Plant 24" O.C.
	28	Zamia floridana	Coontie	24" Hgt x 24" Spr.	
		Groundcovers			
	150	Dianella tasmanica 'Blueberry'	Blueberry Flax Lily	18" Ht. x 18" Spr.	Plant 24" O.C.
	248	Duranta erecta 'Gold Mound'	Gold Mound Duranta	15" Ht. x 15" Spr.	Plant 18" O.C.
	663	Ficus microcarpa 'Green Island'	Green Island Ficus	15" Ht. x 15" Spr.	Plant 15" O.C.
	41	Jasminum volubile	Wax Jasmine	24" Hgt x 24" Spr.	Plant 24" O.C.
	95	Liriope muscari 'Evergreen Giant'	Evergreen Giant Liriope	1 Gal.	Plant 20" O.C.
	28	Raphiolepis indica	Indian Hawthorn	6" Ht. x 18" Spr.	Plant 18" O.C.
		Other			

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FSU# 03146

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NO.	DATE	DESCRIPTION
1.	1.12.22	City Comments
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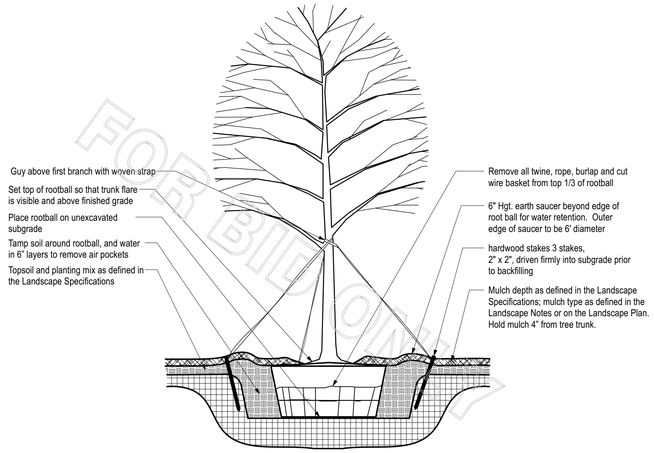
FOR BID

SHEET
Landscape Plan

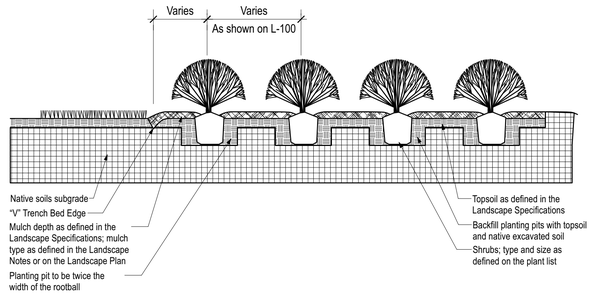
SHEET NUMBER
L-101



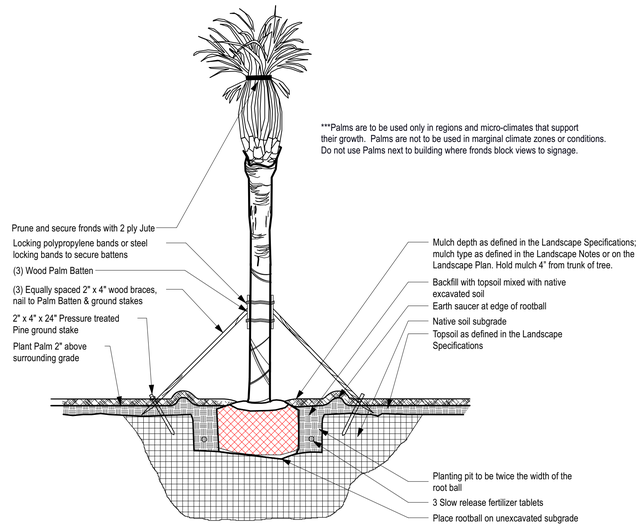
NOTE

1. Hole to be twice the width of the rootball.
2. Do not heavily prune tree at planting. Prune only crossover limbs, broken or dead branches; Do not remove the terminal buds of branches that extend to the edge of the crown.
3. Each tree must be planted such that the trunk flare is visible at the top of the rootball. Trees where the trunk flare is not visible shall be rejected. Do not cover the top of the rootball with soil. Mulch to be held back 4" away from trunk.
4. Remove Guy Wires and Staking when warranty period has expired (after one year).

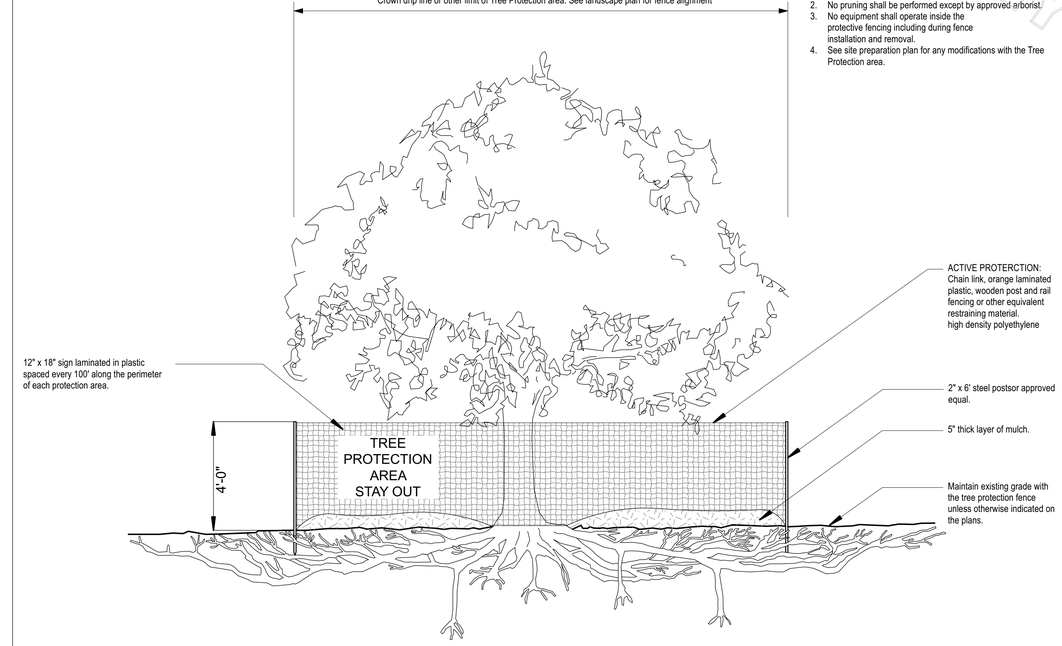
1 TREE PLANTING & STAKING
SCALE: NTS



2 SHRUB BED PLANTING DETAIL
SCALE: NTS



3 PALM PLANTING & STAKING DETAIL
SCALE: NTS



Notes:

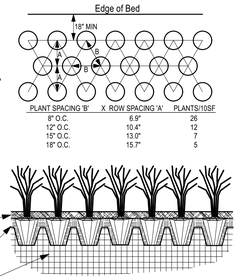
1. See notes for additional tree protection requirements.
2. No pruning shall be performed except by approved arborist.
3. No equipment shall operate inside the protective fencing including during fence installation and removal.
4. See site preparation plan for any modifications with the Tree Protection area.

SECTION VIEW

4 TREE PROTECTION FENCING DETAIL
SCALE: NTS

A = Row Spacing
B = On Center Spacing

Space plants in a triangular pattern as shown, spaced equally from each other at spacing indicated on the plant list

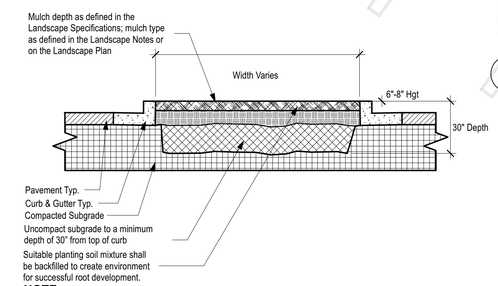


PLANT SPACING 'B'	X ROW SPACING 'A'	PLANTS/10SF
8" O.C.	6.5"	26
12" O.C.	10.4"	12
15" O.C.	13.0"	7
18" O.C.	15.7"	5

NOTE

1. Space groundcover plants in accordance with indicated spacing listed on the plant list, or as shown on the landscape plan.
2. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants.
3. Plant to within 24" of the trunks of trees and shrubs within planting bed and to within 18" of edge of bed.

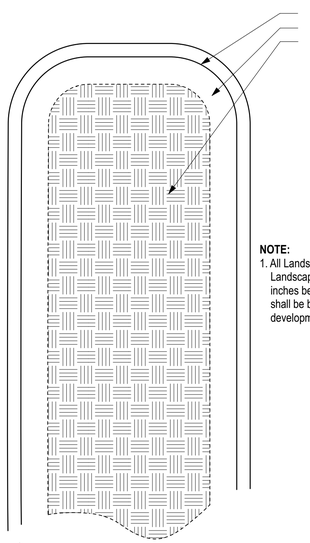
5 GROUNDCOVER PLANTING DETAIL
SCALE: NTS



NOTE

1. Clean construction debris from within landscape island areas (ie. concrete, rocks, rubble, building materials, ect), prior to installing topsoil and plant material.
2. Fracture/loosen existing subgrade to a minimum 30" depth. Remove and replace any subgrade unsuitable for planting. Once subgrade is clean of debris and loosened, suitable planting soil mixture shall be backfilled to create environment for successful root development.
3. Plant material as per the Landscape Plan.
4. Install plant material as per tree, shrub and ground cover planting details, and as defined in the Landsacpe Specifications.
5. Install mulch or sod as specified on the Landscape Plan, and as defined in the Landscape Specifications.

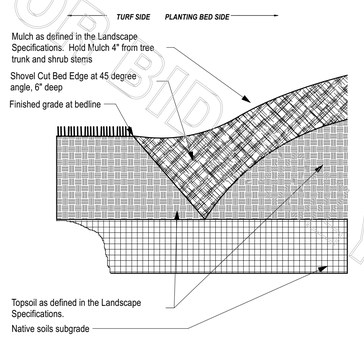
7 PARKING ISLAND DETAIL
SCALE: NTS



NOTE:

1. All Landscape Islands, Interior Islands Strips, and Perimeter Landscape Strips shall be excavated down to a depth of 30 inches below existing grade and suitable planting soil mixture shall be backfilled to create enviroment for successful root development.

6 LANDSCAPE ISLAND EXCAVATION DETAIL
SCALE: NTS



8 "V" TRENCH BED EDGING
SCALE: NTS

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FOR BID

SHEET
Landscape Details

SHEET NUMBER
L-102

LANDSCAPE SPECIFICATIONS

PART 1 - GENERAL

DESCRIPTION
Provide trees, shrubs, ground covers, sod, and annuals/perennials as shown and specified on the landscape plan, The work includes:
1. Soil preparation.
2. Trees, shrubs, ground covers, and annuals/perennials.
3. Planting mixes.
4. Top Soil, Mulch and Planting accessories.
5. Maintenance.
6. Decorative stone.

Related Work:
1. Irrigation System; if provided, see irrigation specifications (sheet L-2.2)

QUALITY ASSURANCE
Plant names indicated; comply with “Standardized Plant Names” as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.

Comply with sizing and grading standards of the latest edition of “American Standard for Nursery Stock”. A plant shall be dimensioned as it stands in its natural position.

All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of 2 years.

Nursery Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable, at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated and 75% are of the maximum size indicated.

Before submitting a bid, the Contractor shall have investigated the sources of supply and be satisfied that they can supply the listed plants in the size, variety and quality as specified. Failure to take this precaution will not relieve the Contractor from their responsibility for furnishing and installing all plant materials in strict accordance with the Contract Documents without additional cost to the Owner. The Landscape Architect shall approve any substitutes of plant material, or changes in plant material size, prior to the Landscape Contractor submitting a bid.

DELIVER, STORAGE AND HANDLING
Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Spray deciduous plants in foliage with an approved “Anti-Desiccant” immediately after digging to prevent dehydration. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Landscape Architect. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches. Cover plants transported on open vehicles with a protective covering to prevent wind burn.

PROJECT CONDITIONS
Protect existing utilities, paving, and other facilities from damage caused by landscape operations.

A complete list of plants, including a schedule of sizes, quantities, and other requirements are shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.

The irrigation system will be installed prior to planting. Locate, protect and maintain the irrigation system during planting operations. Repair irrigation system components damaged during planting operations; at the Contractor’s expense. Refer to the irrigation specifications, irrigation plan and irrigation details.

Do not begin landscape accessory work before completion of final grading or surfacing.

WARRANTY
Warrant plant material to remain alive, be healthy and in a vigorous condition for a period of 1 year after completion and final acceptance of entire project.

Replace, in accordance with the drawings and specifications, all plants that are dead or, are in an unhealthy, or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor’s negligence. The cost of such replacement(s) is at the Contractor’s expense. Warrant all replacement plants for 1 year after installation.

Warranty shall not include damage, loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, winds over 75 miles per hour, winter kill caused by extreme cold, severe winter conditions not typical of planting area, and/or acts of vandalism or negligence on a part of the Owner.

Remove and immediately replace all plants, found to be unsatisfactory during the initial planting installation.

Maintain and protect plant material, lawns, and irrigation until final acceptance is made.

ACCEPTANCE
Inspection of planted areas will be made by the Owner’s representative.
1. Planted areas will be accepted provided all requirements, including maintenance, have been complied with and plant materials are alive and in a healthy, vigorous condition.

Upon acceptance, the Contractor shall commence the specified plant maintenance.

CODES, PERMITS AND FEES
Obtain any necessary permits for this Section of Work and pay any fees required for permits.

The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto; also as depicted on the landscape and irrigation construction set.

PART 2 - PRODUCTS

MATERIALS
Plants: Provide typical of their species or variety; with normal, densely developed branches and vigorous, fibrous root systems. Provide only sound, healthy, vigorous plants free from defects, disfiguring knots, sun scald injuries, frost cracks, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids and open spaces. Plants held on storage will be rejected if they show signs of growth during the storage period.
1. Balled and plants wrapped with burlap, to have firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the “American Standard for Nursery Stock”. Cracked or mushroomed balls, or signs of circling roots are not acceptable.
2. Container- grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.
   a. No plants shall be loose in the container.
   b. Container stock shall not be pot bound.
3. Plants planted in rows shall be matched in form.
4. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect.
   a. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
5. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the plant list.
6. No pruning wounds shall be present with a diameter of more than 1” and such wounds must show vigorous bark on all edges.
7. Evergreen trees shall be branched to the ground or as specified in plant list.
8. Shrubs and small plants shall meet the requirements for spread and height indicated in the plant list.
   a. The measurements for height shall be taken from the ground level to the height of the top of the plant and not the longest branch.
   b. Single stemmed or thin plants will not be accepted.
   c. Side branches shall be generous, well-twigged, and the plant as a whole well-bushed to the ground.
   d. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

ACCESSORIES
Topsoil: Shall be Fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, roots, sticks, and other foreign materials, with acidity range of between pH 6.0 and 6.8.

Note: All planting areas shall be cleaned of construction debris (ie. Concrete, rubble, stones, building material, etc.) prior to adding and spreading of the top soil.
1. *Sod Areas:* Spread a minimum 4” layer of top soil and rake smooth.
2. *Planting bed areas:* Spread a minimum 4” layer of top soil and rake smooth.
3. *Landscape Islands/Medians:* Fracture/loosen existing subgrade to a minimum 24” depth. Remove and replace any subgrade unsuitable for planting. Once subgrade is clean of debris and loosened, add topsoil to a minimum berm 6”-8” height above island curbing.
4. *Annual/Perennial bed areas:* Add a minimum of 4” organic matter and till to a minimum 12” depth.

Mulch: Type selected dependent on region and availability; see landscape plans for type of much to be used. Hold mulch 4” from tree trunks and shrub stems.
1. Hardwood: 6 month old well rotted double shredded native hardwood bark mulch not larger than 4” in length and ½” in width, free of wood chips and sawdust. Install minimum depth of 3”.
2. Pine Straw: Pine straw to be fresh harvest, free of debris, bright in color. Bales to be wired and tightly bound. Needles to be dry. Install minimum depth of 3”.
3. River Rock: (color) light gray to buff to dark brown, washed river rock, 1” – 3” in size. Install in shrub beds to an even depth of 3”. Weed control barrier to be installed under all rock mulch areas. Use caution during installation not to damage plant material.
4. Mini Nuggets: Install to a minimum depth of 2”-3” at all locations of annual and perennial beds. Lift the stems and leaves of the annuals and carefully spread the mulch to avoid injuring the plants. Gently brush the mulch off the plants.

Guying/Staking:
1. Arbortie: Green (or white) staking and guying material to be flat, woven, polypropylene material, ¾” wide 900 lb. break strength. Arbortie shall be fastened to stakes in a manner which permits tree movement and supports the tree.
2. Remove Guying/Staking after one year from planting.

Tree Wrap: Tree wraps should be used on young, newly planted thin-barked trees (Cherry, Crabapple, Honey Locust, Linden, Maple, Mountain Ash, Plum) that are most susceptible to sun scald/Sunburn. Standard waterproofed tree wrapping paper, 2-1/2” wide, made of 2 layers of crepe Draft paper weighing not less than 30 lbs. per ream, cemented together with asphalt. Wrap the tree in the fall and leave the wrap in place throughout the winter and early spring. Tree wraps are temporary and no longer needed once trees develop corky bark.

PART 3 – EXECUTION

INSPECTION
Prior to beginning work, the Landscape Contractor shall inspect the subgrade, general site conditions, verify elevations, utility locations, irrigation, approve top soil provided by the General Contractor and observe the site conditions under which the work is to be done. Notify the General Contractor of any unsatisfactory conditions, and work shall not proceed until such conditions have been corrected and are acceptable to the Landscape Contractor.

PREPARATION
Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

Locate plants as indicated on the plans or as approved in the field after staking by the Landscape Contractor. If obstructions are encountered that are not shown on the drawings, do not proceed with planting operations until alternate plant locations have been selected and approved by the Landscape Architect; spacing of plant material shall be as shown on the landscape plan.

Excavate circular plant pits with vertical sides, except for plants specifically indicated to be planted in beds. Provide shrub pits at least 12” greater than the diameter of the root system and 24” greater for trees. Depth of pit shall accommodate the root system. Provide undisturbed sub grade to hold root ball at nursery grade as shown on the drawings.

INSTALLATION
Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set plant material 2” – 3” above the finish grade. No filling will be permitted around trunks or stems. Backfill the pit with topsoil mix and excavated material. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water.

After balled and wrapped in burlap plants are set, muddle planting soil mixture around bases of balls and fill all voids.
1. Remove all burlap, ropes, and wires from the top 1/3 of the root ball

Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 24” of the trunks of trees and shrubs within planting bed and to within 18” of edge of bed.

Mulching:
1. Mulch tree and shrub planting pits and shrub beds with required mulching material (see landscape plan for mulch type); depth of mulch as noted above. **Hold mulch back 4” away from tree trunks and shrub stems.** Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.

Decorative Stone: (where indicated on landscape plan)
1. Install weed control barrier over sub-grade prior to installing stone. Lap 6” on all sides.
2. Place stone without damaging weed barrier.
3. Arrange stones for best appearance and to cover all weed barrier fabric.

Wrapping, guying, staking:
1. Inspect trees for injury to trunks, evidence of insect infestation, and improper pruning before wrapping.
2. Wrapping:
   a. Wrap trunks of all young newly planted trees known to have thin bark. Wrap spirally from bottom to top with specified tree wrap and secure in place.
   b. Overlap ½ the width of the tree wrap strip and cover the trunk from the ground to the height of the second branch.
   c. Secure tree wrap in place with twine wound spirally downward in the opposite direction, tied around the tree in at least 3 places in addition to the top and bottom.
   d. Wrap the trees in the fall and leave the wrap in place throughout the winter and early spring.
   d. Tree wraps are temporary and no longer needed once the trees develop corky bark.
3. Staking/Guying:
   a. Stake/guy all trees immediately after lawn sodding operations and prior to acceptance.
   b. Stake deciduous trees 2” caliper and less. Stake evergreen trees under 7’-0” tall.
      1. Stakes are placed in line with prevailing wind direction and driven into undisturbed soil.
      2. Ties are attached to the tree, usually at the lowest branch.
   c. Guy deciduous trees over 2” caliper. Guy evergreen trees 7’-0” tall and over.
      1. Guy wires to be attached to three stakes driven into undisturbed soil, with one stake placed in the direction of the prevailing wind.
      2. Ties are attached to the tree as high as practical.
      3. The axis of the stake should be at 90 degree angle to the axis on the pull of the guy wire.
4. **Remove all guying and staking after one year from planting.**

Pruning:
1. Prune deciduous trees and evergreens only to remove broken or damaged branches.

WORKMANSHIP
During landscape/irrigation installation operations, all areas shall be kept neat and clean. Precautions shall be taken to avoid damage to existing structures. All work shall be performed in a safe manner to the operators, the occupants and any pedestrians.

Upon completion of installation operations, all excess materials, equipment, debris and waste material shall be cleaned up and removed from the site; unless provisions have been granted by the owner to use on-site trash receptacles. Sweep parking and walks clean of dirt and debris. Remove all plant tags and other debris from lawns and planting areas.

Any damage to the landscape, the structure, or the irrigation system caused by the landscape contractor shall be repaired by the landscape contractor without charge to the owner.

MAINTENANCE
Contractor shall provide maintenance until work has been accepted by the Owner's Representative.

Maintenance shall include mowing, fertilizing, mulching, pruning, cultivation, weeding, watering, and application of appropriate insecticides and fungicides necessary to maintain plants and lawns free of insects and disease.
1. Re-set settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
2. repair guy wires and stakes as required. Remove all stakes and guy wires after 1 year.
3. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
4. Water trees, plants and ground cover beds within the first 24 hours of initial planting

LANDSCAPE MAINTENANCE SPECIFICATIONS

The Contractor shall provide as a separate bid, maintenance for a period of ***1 year*** after final acceptance of the project landscaping. The Contractor must be able to provide continued maintenance if requested by the Owner or provide the name of a reputable landscape contractor who can provide maintenance.

STANDARDS
All landscape maintenance services shall be performed by trained personnel using current, acceptable horticultural practices.

All work shall be performed in a manner that maintains the original intent of the landscape design.

All chemical applications shall be performed in accordance with current county, state and federal laws, using EPA registered materials and methods of application. These applications shall be performed under the supervision of a Licensed Certified applicator.

APPROVALS
Any work performed in addition to that which is outlined in the contract shall only be done upon written approval by the Owner’s Representative (General Manager of the restaurant).

All seasonal color selections shall be approved by the General Manager prior to ordering and installation.

SOIL TESTING
The maintenance contractor shall perform soil tests as needed to identify imbalances or deficiencies causing plant material decline. The owner shall be notified of the recommendation for approval, and the necessary corrections made at an additional cost to the owner.

Acceptable Soil Test Results

	Landscape Trees and Shrubs	Turf
pH Range	5.0-7.0	6.0-7.0
Organic Matter	>1.5%	>2.5%
Magnesium (Mg)	100+lbs./acre	100+lbs./acre
Phosphorus (P2O5)	150+lbs./acre	150+lbs./acre
Potassium (K2O)	120+lbs./acre	120+lbs./acre
Soluble salts/ Conductivity	Not to exceed 900ppm/1.9 mmhos/cm in soil; not to exceed 1400 ppm/2.5 mmhos/cm in high organic mix	Not to exceed 750ppm/0.75 mmhos/cm in soil; not to exceed 2000 ppm/2.0 mmhos/cm in high organic mix

For unusual soil conditions, the following optional tests are recommended with levels not to exceed:

Boron	3 pounds per acre
Manganese	50 pounds per acre
Potassium (K2O)	450 pounds per acre
Sodium	20 pounds per acre

WORKMANSHIP
During landscape maintenance operations, all areas shall be kept neat and clean. Precautions shall be taken to avoid damage to existing structures. All work shall be performed in a safe manner to the operators, the occupants and any pedestrians.

Upon completion of maintenance operations, all debris and waste material shall be cleaned up and removed from the site, unless provisions have been granted by the owner to use on-site trash receptacles.

Any damage to the landscape, the structure, or the irrigation system caused by the maintenance contractor, shall be repaired by the maintenance contractor without charge to the owner.

TURF

GENERAL CLEAN UP
Prior to mowing, all trash, sticks, and other unwanted debris shall be removed from lawns, plant beds, and paved areas.

MOWING
Warm season grasses (i.e. Bermuda grass) shall be maintained at a height of 1” to 2” during the growing season.

Cool season grasses, including blue grass, tall fescue, perennial ryegrass, etc., shall be maintained at a height of 2” to 3” in spring and fall. From June through September, mowing height shall be maintained at no less than 3”.

The mowing operation includes trimming around all obstacles, raking excessive grass clippings and removing debris from walks, curbs, and parking areas. Caution: Weed eaters should NOT be used around trees because of potential damage to the bark.

EDGING
Edging of all sidewalks, curbs and other paved areas shall be performed once every other mowing. Debris from the edging operations shall be removed and the areas swept clean. Caution shall be used to avoid flying debris.

LIMING & FERTILIZING
A soil test shall be taken to determine whether an application of limestone in late fall is necessary. If limestone is required, the landscape contractor shall specify the rate, obtain approval from the owner and apply it at an additional cost. A unit price for liming of turf shall accompany the bid based on a rate of 50 pounds per 1000 square feet.

Fertilizer shall be applied in areas based on the existing turf species.

LAWN WEED CONTROL: HERBICIDES
Selection and proper use of herbicides shall be the landscape contractor’s responsibility. All chemical applications shall be performed under the supervision of a Licensed Certified Applicator. **Read the label prior to applying any chemical.**

INSECT & DISEASE CONTROL FOR TURF
The contractor shall be responsible for monitoring the site conditions on each visit to determine if any insect pest or disease problems exist. The contractor shall identify the insect pest or disease, as well as the host plant, and then consult the most current edition of the Cooperative Extension Service’s “Commercial Insecticide Recommendation for Turf” for control. The licensed applicator shall be familiar with the label provided for the selected product prior to application.

Inspection and treatment to control insect pests shall be included in the contract price.

TREES, SHRUBS, & GROUND COVER

PRUNING
All ornamental trees, shrubs and ground cover shall be pruned when appropriate to remove dead or damaged branches, develop the natural shapes. **Do not shear trees or shrubs**. If previous maintenance practice has been to shear and ball, then a natural shape will be restored gradually.

Pruning Guidelines:
1. Prune those that flower before the end of June immediately after flowering. Flower buds develop during the previous growing season. Fall, winter or spring pruning would reduce the spring flowering display.
2. Prune those that flower in summer or autumn in winter or spring before new growth begins, since these plants develop flowers on new growth.
3. Delay pruning plants grown for ornamental fruits, such as cotoneasters, pyracanthas and viburnums.
4. Hollies and other evergreens may be pruned during winter in order to use their branches for seasonal decoration. However, severe pruning of evergreens should be done in early spring only.
5. Broadleaf evergreen shrubs shall be hand-pruned to maintain their natural appearance after the new growth hardens off.
6. Hedges or shrubs that require shearing to maintain a formal appearance shall be pruned as required. Dead wood shall be removed from sheared plants before the first shearing of the season.
7. Conifers shall be pruned, if required, according to their genus.
   A. Yews, junipers, hemlocks, arborvitae, and false-cypress may be pruned after new growth has hardened off in late summer. If severe pruning is necessary, it must be done in early spring.
   B. Firs and spruces may be lightly pruned in late summer, fall, or winter after completing growth. Leave side buds. Never cut central leader.
   C. Pines may be lightly pruned in early June by reducing candles.
8. Groundcover shall be edged and pruned as needed to contain it within its borders.
9. Thinning: Remove branches and water sprouts by cutting them back to their point of origin on parent stems. This method results in a more open plant, without stimulating excessive growth. Thinning is used on crepe myrtles, lilacs, viburnums, smoke bush,etc.
10. Renewal pruning: Remove oldest branches of shrub at ground, leaving the younger, more vigorous branches. Also remove weak stems. On overgrown plants, this method may be best done over a three-year period. Renewal pruning may be used on abelia, forsythia, deutzia, spiraea, etc.

Plants overhanging passageways and parking areas and damaged plants shall be pruned as needed.

Shade trees that cannot be adequately pruned from the ground shall not be included in the Maintenance Contract. A certified arborist under a separate contract shall perform this type of work.

SPRING CLEANUP
Plant beds shall receive a general cleanup before fertilizing and mulching. Cleanup includes removing debris and trash from beds and cutting back herbaceous perennials left standing through winter, e.g. ornamental grasses, Sedum Autumn Joy.

FERTILIZING
For trees, the rate of fertilization depends on the tree species, tree vigor, area available for fertilization, and growth stage of the tree. Mature specimens benefit from fertilization every 3 to 4 years; younger trees shall be fertilized more often during rapid growth stages.

The current recommendation is based on the rate of 1000 square feet of area under the tree to be fertilized. For deciduous trees, 2 to 6 pounds of Nitrogen per 1000 square feet; for narrow-leaf evergreens, 1 to 4 pounds of Nitrogen per 1000 square feet; for broadleaf evergreens, 1 to 3 pounds of Nitrogen per 1000 square feet.

Shrubs and groundcover shall be top-dressed with compost 1” deep, or fertilized once in March with 10-6-4 analysis fertilizer at the rate of 3 pounds per 100 square feet of bed area. Ericaceous material shall be fertilized with an ericaceous fertilizer at the manufacturer’s recommendation rate. If plants are growing poorly, a soil sample should be taken.

MULCHING
Annually, all tree and shrub beds will be prepared and mulched, to a minimum depth of 3” with quality mulch to match existing. Bed preparation shall include removing all weeds, cleaning up said bed, edging and cultivating decayed mulch into the soil. Debris from edging is to be removed from beds where applicable. If deemed necessary, a pre-emergent herbicide may be applied to the soil to inhibit the growth of future weeds.

Organically maintained gardens shall not receive any pre-emergent herbicides. Mulch in excess of 4” will be removed from the bed areas. SPECIAL CARE shall be taken in the mulching operation not to over-mulch or cover the base of trees and shrubs. This can be detrimental to the health of the plants.

WEEDING
All beds shall be weeded on a continuous basis throughout the growing season to maintain a neat appearance at all times.

Pre-emergent (soil-applied) and post-emergent (foliar-applied) herbicides shall be used where and when applicable and in accordance with the product’s label.

INSECT & DISEASE CONTROL: TREES, SHRUBS & GROUNDCOVER

The maintenance contractor shall be responsible for monitoring the landscape site on a regular basis. The monitoring frequency shall be monthly except for growing season, which will be every other week. Trained personnel shall monitor for plant damaging insect activity, plant pathogenic diseases and potential cultural problems in the landscape. The pest or cultural problem will be identified under the supervision of the contractor.

For plant damaging insects and mites identified in the landscape, the contractor shall consult and follow the recommendations of the most current edition of the state Cooperative Service publication on insect control on landscape plant material.

Plant pathogenic disease problems identified by the contractor that can be resolved by pruning or physical removal of damaged plant parts will be performed as part of the contract. For an additional charge, plant pathogenic diseases that can be resolved through properly timed applications of fungicides shall be made when the owner authorizes it.

If the contractor notes an especially insect-or disease-prone plant species in the landscape, he/she will suggest replacement with a more pest-resistant cultivar or species that is consistent with the intent of the landscape design.

NOTE: For identification of plant-damaging insects and mites, a reference textbook that can be used is *Insects that feed on Trees and Shrubs* by Johnson and Lyon, Comstock Publishing Associates. For plan pathogenic diseases, two references are suggested: *Scouting and Controlling Woody Ornamental Diseases in Landscapes and Nurseries*, authorized by Gary Moorman, published by Penn State College of Agricultural Sciences, and *Diseases of Trees and Shrubs* by Sinclair and Lyon, published by Comstock Publishing Press.

TRASH REMOVAL
The maintenance contractor shall remove trash from all shrub and groundcover beds with each visit.

LEAF REMOVAL
All fallen leaves shall be removed from the site in November and once in December. If requested by the owner, the maintenance contractor, at an additional cost to the owner shall perform supplemental leaf removals.

WINTER CLEAN-UP
The project shall receive a general clean-up once during each of the winter months, i.e., January, February, and March.

Clean-up includes:
- Cleaning curbs and parking areas
- Removing all trash and unwanted debris
- Turning mulch where necessary
- Inspection of grounds

SEASONAL COLOR: PERENNIALS, ANNUALS, AND BULBS

The installation of perennials, annuals, and bulbs, unless specified herein, shall be reviewed with the owner, and, if accepted, installed and billed to the owner.

SEASONAL COLOR MAINTENANCE

Perennialization of Bulbs:
1. After flowering, cut off spent flower heads.
2. Allow leaves of daffodils and hyacinths to remain for six weeks after flowers have faded. Cut off at base.
3. Allow leaves of other bulbs to yellow naturally and then cut off at base.
4. Apply fertilizer after flowering in spring, possibly again in fall. Apply 10-10-10 at the rate of 2 pounds per 1000 square feet, or top-dress with compost 1” deep. Fall fertilization with a bulb fertilizer or mulching with 1” of compost is optional.

Flower Rotation:
1. Bulbs: Remove the entire plant and bulb after flowers have faded or at the direction of the owner, and install new plants if included in contract.
2. Summer Annuals or Fall Plants:
   a. Dead heading: Pinch and remove dead flowers on annuals as necessary.
   b. Fertilizing Summer Annuals: Fertilize using one or two methods: Apply a slow-release fertilizer in May following manufacturer’s recommendations. A booster such as 10-10-10 may be necessary in late summer. Or, apply liquid fertilizations of 20-20-20 water-soluble fertilizers, not to exceed 2 pounds of 20-20-20 per 100 gallons of water, monthly; or mulch with compost 1” deep.
   c. Removal: If fall plants are to be installed, summer annuals shall be left in the ground until the first killing frost and then removed, unless otherwise directed by the owner.

Perennials:
1. After initial installation, if a time-released fertilizer has been incorporated during plant installation, no more fertilizer need be applied the first growing season.
2. The following year:
   a. Fertilize perennials with a slow-release fertilizer or any 50% organic fertilizer, or mulch perennials with compost 1” deep.
   b. Cut all deciduous perennials flush to the ground by March 1, if this was not done the previous fall, to allow new growth to develop freely.
   c. Mulch the perennial bed once in early spring at 1”-2” depth. If soil is bared in late fall, re-mulch lightly after ground is frozen to protect perennials.
   d. Inspect for insect or disease problems on perennials. Monitor and control slugs on hostas and ligularias. Powdery mildew on phlox, monardas, and asters can be prevented with properly timed fungicides or use of disease-resistant varieties.
   e. Weed perennial bed as specified in “WEEDING” above.
   f. Prune branching species to increase density. Cut only the flowering stems after blooming. Do not remove the foliage.
3. The following fall cut back deteriorating plant parts unless instructed to retain for winter interest, e.g. Sedum Autumn Joy and ornamental grasses.
4. Long-term Care:
   a. Divide plants that overcrowd the space provided. Divide according to the species. Some need frequent dividing, e.g. asters and yarrow every two years; other rarely, if ever, e.g. peonies, hostas, and astilbe.
   b. For detailed information regarding the care of specific perennials, refer to *All About Perennials* by Ortho; *Perennials: How to Select, Grow and Enjoy* by Pamela Harper and Frederick McGouty, Hp Books Publisher; *Herbaceous Perennial Plants: A Treatise on their Identification, Culture and Garden Attributes* by Allan Armitage, Stipes Pub LLC.

SUMMARY OF MAINTENANCE

LAWN MAINTENANCE
1. Soil analysis performed annually to determine pH. If pH does not fall within specified range, adjust according to soil test recommendations.
2. Maintain proper fertility and pH levels of the soil to provide an environment conducive to turf vitality for cool season grasses
3. Mow warm and cool season on a regular basis and as season and weather dictates. Remove no more than the top 1/3 of leaf blade. Clippings on paved and bed areas will be removed.
4. Aerate warm season turf areas to maintain high standards of turf appearance.
5. Apply pre-emergent to turf in two applications in early February and early April to extend barrier.
6. Apply post emergent as needed to control weeds.
7. Mechanically edge curbs and walks.
8. Apply non-selective herbicide, to mulched bed areas and pavement and remove excess runners to maintain clean defined beds.

TREE, GROUNDCOVER, AND SHRUB BED MAINTENANCE
1. Prune shrubs, trees and groundcover to encourage healthy growth and create a natural appearance.
2. Mulch to be applied in February/March with a half rate in late summer to top dress.
3. Apply pre-emergent herbicides in February and April.
4. Manual weed control to maintain clean bed appearance.
5. Apply fungicides and insecticides as needed to control insects and disease.
6. Ornamental shrubs, trees and groundcovers to be fertilized three (3) times per year with a balanced material (January/February, April/May, and October/November)
7. Edge all mulched beds.
8. Remove all litter and debris.

GENERAL MAINTENANCE
1. Remove all man-made debris, blow edges.
2. Inspect grounds on a monthly basis and schedule inspection with Unit Operator.

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FSU# 03146

REVISION SCHEDULE

NO.	DATE	DESCRIPTION
1.	1.12.22	City Comments
2.	3.9.22	City Comments
3.	3.15.22	New Site Plan
4.	3.15.22	Issued for Bid

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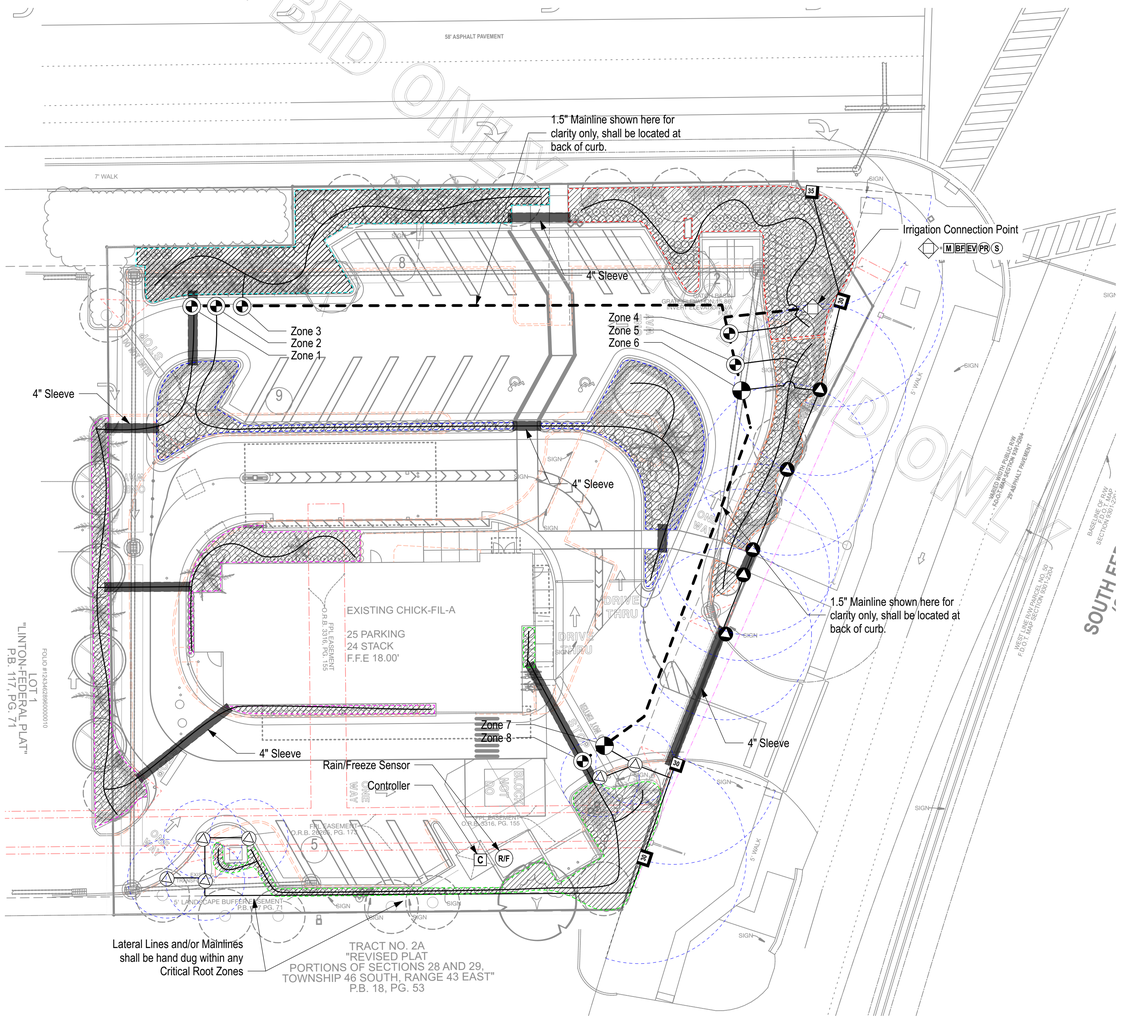
SHEET
FOR BID
Landscape & Maintenance Specifications

SHEET NUMBER
L-103

IRRIGATION ZONES

SMART CONTROLLER

1	DRIP	6	10.76 GPM
2	DRIP	7	6.59 GPM
3	DRIP	8	DRIP
4	DRIP		
5	DRIP		



IRRIGATION LEGEND - RAINBIRD PRODUCTS ONLY

M	1" IRRIGATION METER	PROVIDED BY THE GENERAL CONTRACTOR
S	1" MANUAL SHUTOFF VALVE	1 REQUIRED
BF	BACKFLOW PREVENTER	AS REQUIRED BY CITY
PR	1" PRESSURE REGULATOR	AS REQUIRED
EV	1" ELECTRICAL MASTER VALVE	1 REQUIRED
	LANDSCAPE DRIPLINE	RAINBIRD XFD-09-18
	45-270 ADJUSTABLE ARC ROTARY NOZZLE - 8'-14' RADIUS	RAINBIRD RD1800-S-P45-R-VAN14
	45-270 ADJUSTABLE ARC ROTARY NOZZLE - 17'-24' RADIUS	RAINBIRD RD1800-S-P45-R-VAN24
	180 MPR SERIES STREAM ROTOR NOZZLE - 25',30',35' RADIUS	RAINBIRD 5000-R-MPR-H25/30/35 (as indicated at the head)
	90 MPR SERIES STREAM ROTOR NOZZLE - 25',30',35' RADIUS	RAINBIRD 5000-R-MPR-Q25/30/35 (as indicated at the head)
	1" ELECTRIC VALVE	RAINBIRD 100-PGA
	1" DRIP CONTROL ZONE VALVE	RAINBIRD XCZ-100-PRB-COM
C	AUTOMATIC CONTROLLER	RAINBIRD ESP-ME3 (120V required); expansion modules as needed
R/F	RAIN/FREEZE SENSOR	RAINBIRD WR2-RFC
———	1" LATERAL LINE	CLASS 200 PVC IRRIGATION PIPE AND FITTINGS - 1" LATERAL LINES
- - -	1.5" MAINLINE	CLASS 200 PVC IRRIGATION PIPE AND FITTINGS - 1.5" MAINLINE
	IRRIGATION SLEEVE - 4" SCH 40 PVC	4" SCH 40 PVC SLEEVE UNDER PAVEMENT installation of sleeves by contractor in location as shown on plan.

IRRIGATION NOTES

1. Irrigation contractor is responsible for locating and protecting all underground utilities prior to trenching.
2. Pressure regulator required by local code if static water pressure at point of connection for site is greater than 80 psi.
3. Irrigation meter and backflow preventor to be provided by the general contractor.
4. All valves to be located in valve box with cover at grade; Locate box in grass area when possible.
5. Automatic controller to be located in the storage room. Rain/freeze sensor shall be located on the trash enclosure respectively; Rain/freeze Sensor to be located free from obstructions and exposed to the weather.
6. All pipes, automatic valves, backflow preventor, manual valve and meter to be located within property lines. Shown outside on drawing for clarity only.
7. 45 psi required per rotor station, 30 psi required per spray station, 40 psi required per drip station. All spray and rotor bodies to have PRS (In-stem pressure regulation) as indicated in the legend.
8. Pop-up height of spray heads to be as follows: 4" in Turf Zones, 12" in Shrub Zones, and 12" in Seasonal/color beds. Rotor height to be 4". MPR Rotor Nozzle size is indicated on drawing for each rotor.
9. 4" SCH 40 PVC sleeves to be located as shown on drawing. Extend sleeve 18" beyond back of curb or pavement. Sleeves to be located and exposed by the general contractor prior to start of irrigation installation.
10. All 1.5" mainlines (class 200 PVC pipe) to have a minimum of 18" cover.
11. All lateral and sub-main pipe (class 200 PVC pipe) to have a minimum of 12" and a maximum of 18" cover.
12. No rocks, boulders, or other extraneous materials to be used in backfilling trenches.
13. All threaded joints to be coated with Teflon Tape or Liquid Teflon.
14. All lines to be thoroughly flushed before installation of sprinkler heads.
15. Must use products specified on this drawing, unless otherwise approved by the Landscape Architect. Refer to the Irrigation Legend for product specs.
16. Irrigation is to be installed as designed, unless otherwise approved by the Landscape Architect.
17. All pipe, valves, drip, spray heads, rotors, controllers, and sensors are to be installed as per manufacturers specifications. For any RainBird products or installation questions call Donn Mann (520)-904-1146.
18. Irrigation contractor shall provide an Irrigation As-Built drawing to the landscape architect; this drawing shall be overnighted within 24 hours of completion of installation.
19. Irrigation Contractor to perform a walk-thru inspection with the Store Operator of the functioning system prior to opening but no later than one week after opening.

SEE SHEET L-201 FOR IRRIGATION DETAILS
SEE SHEET L-202 FOR IRRIGATION SPECIFICATIONS

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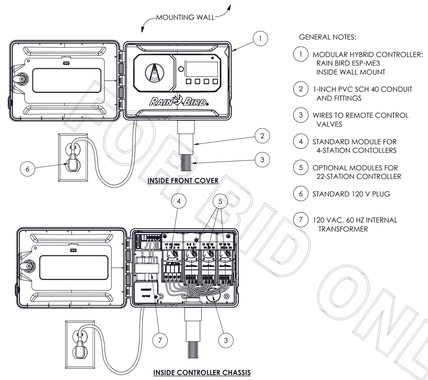
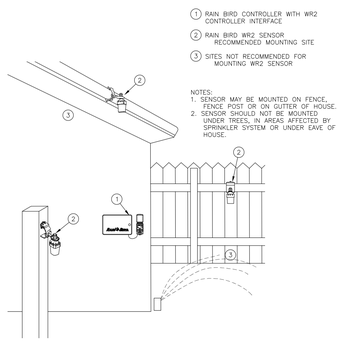
FOR BID

SHEET
Irrigation Plan

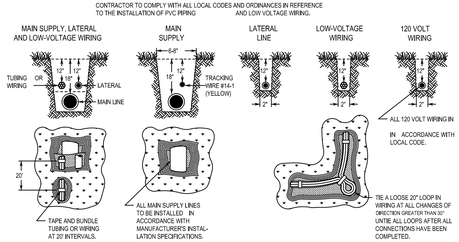
SHEET NUMBER
L-200



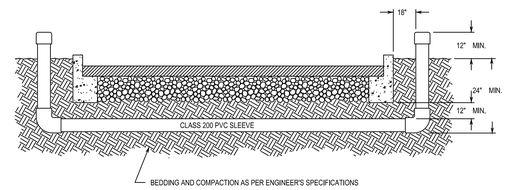
1 IRRIGATION CONTROLLER: ESP-ME3
SCALE: NTS (LOCATE IN STORAGE ROOM)



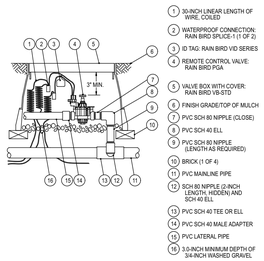
2 WR2 WIRELESS RAIN/FREEZE SENSOR
SCALE: NTS (LOCATE AT DUMPSTER WALL)



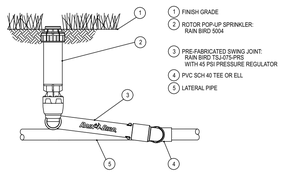
3 IRRIGATION TRENCHING AND PIPE DEPTH
SCALE: NTS



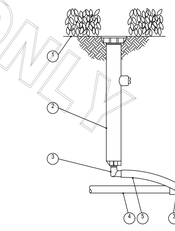
4 IRRIGATION SLEEVING
SCALE: NTS



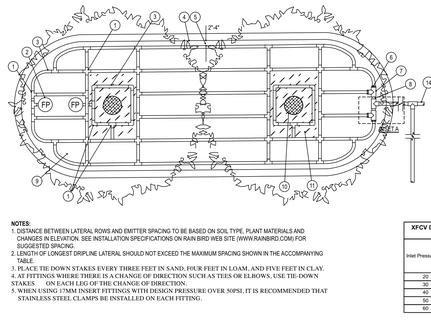
5 IRRIGATION VAVLE: 100-PGA
SCALE: NTS



6 POP-UP ROTOR: 5000 SERIES W/T MPR NOZZLE
SCALE: NTS



7 POP-UP SPRAY: 1800 SERIES
SCALE: NTS

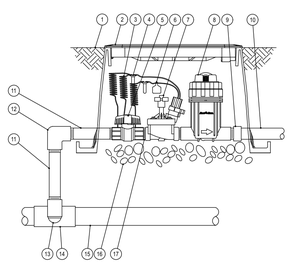


XFCV Dripline Maximum Lateral Lengths (Feet)

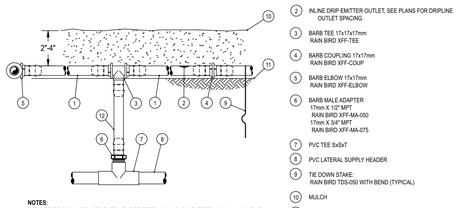
Inlet Pressure psi	12" Spacing		18" Spacing	
	Nominal Flow (GPH)		Nominal Flow (GPH)	
	0.6	0.9	0.6	0.9
20	192	136	254	215
30	289	205	402	337
40	350	248	498	416
50	397	281	573	477
60	436	309	637	529

1 BARB X BARB INSERT EL, TEE OR CROSS: RAIN BIRD XFF-ELBOW (TYPICAL) RAIN BIRD XFF-TEE (TYPICAL) RAIN BIRD XFD-CROSS (TYPICAL)
2 FLUSH POINT (TYPICAL) SEE RAIN BIRD DETAIL "XFD FLUSH POINT"
3 ON-SURFACE DRIPLINE PIPE: RAIN BIRD XF SERIES DRIPLINE POTABLE: XFD DRIPLINE
4 PARKING ISLAND CURB
5 PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"-4" FROM PARKING ISLAND CURB
6 BARB X MALE FITTING: RAIN BIRD XFD-MA FITTING (TYPICAL)
7 PVC SCH 40 TEE OR EL (TYPICAL)
8 PVC SUPPLY MANIFOLD
9 SHRUB OR GROUNDCOVER BED
10 TREE (TYPICAL)
11 MULCH BED FOR TREE
12 2-3 INCHES DEPTH OF MULCH
13 FINISH GRADE
14 PVC DRIP MANIFOLD FROM RAIN BIRD CONTROL ZONE VALVE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
15 PVC RISER PIPE

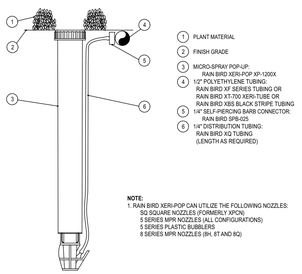
8 DRIP: SYSTEM LAYOUT AND INSTALLATION OVERVIEW
SCALE: NTS



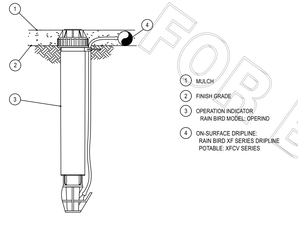
9 DRIP VALVE: XCZ-PRB-100-COM
SCALE: NTS



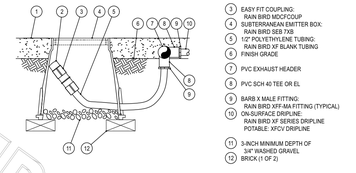
10 DRIP: ON-SURFACE RISER ASSEMBLY
SCALE: NTS



11 DRIP: XERI-POP MICRO SPRAY
SCALE: NTS



12 DRIP: OPERATION INDICATOR
SCALE: NTS



13 DRIP: DRIPLINE FLUSH POINT
SCALE: NTS

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SHEET
Irrigation Details

FOR BID

SHEET NUMBER
L-201

IRRIGATION COMPONENTS AND/OR SYSTEMS

PART 1 – GENERAL

SECTION INCLUDES

Work to be performed under this Section shall consist of furnishing all labor and materials necessary to construct a complete working and tested sprinkler irrigation system as per all drawings and specifications.

REFERENCES

A. ANSI – American National Standards Institute
B. ASIC – American Society of Irrigation Consultants: ASIC Grounding Guideline.
C. ASSE – American Society of Sanitary Engineering: ASSE 1013, 1015: Backflow Preventers, Pressure Reducers.
D. ASTM – American Society of Testing and Materials
E. IA – The Irrigation Association: Main BMP Document.
F. NFPA – National Fire Protection Association: NFPA 70 National Electrical Code.
G. UL – Underwriters Laboratories: UL Wires and Cables.

PERFORMANCE REQUIREMENTS

A. All work to be performed to current standards of SEI and of the local governing municipality.
B. PVC Pipe: Must be stamped with certified NFS.
C. Contractor shall be responsible to obtain all necessary permits and to comply with electrical company requirements.
D. No substitutions of materials are allowed unless approved by Landscape Architect.

QUALITY ASSURANCE

A. Contractor shall have considerable experience and demonstrate ability in the installation of irrigation system(s) of specified type(s) in a neat, orderly, and responsible manner in accordance with recognized standards of workmanship.
B. All work shall be performed in accordance with the best standards of practice relating to the trade.
C. Contractor shall provide an irrigation as-built drawing to the designer responsible for the irrigation plan. **This drawing shall be overnighted to the respective party within 24 hours of installation completion.**

WARRANTY

A. Contractor shall provide a one year warranty that covers all workmanship and labor.
B. Contractor shall provide a five year warranty that covers all materials.

PART 2 - PRODUCTS

PIPE AND FITTINGS

A. Material: PVC
B. Pressure Pipe: Class 200.
C. Lateral Pipe: Class 200, Polyethylene for Northeastern Climate.
D. Fittings: Schedule 40, solvent welded or threaded.
E. Risers: Schedule 80, threaded.
F. Sleeves: Schedule 40, minimum 4".

AUTOMATIC CONTROLLER

A. Irrigation controller specifications include but are not limited to:
   1. The controller shall be of a hybrid type that is microelectronic circuitry capable of fully automatic or manual operation.
   2. All stations shall have the capability of independently obeying or ignoring the weather sensor as well as using or not using the master valve.
   3. The controller shall have the capability of shutting off the system on rainy days.
B. Control zone kit for drip zones with flows from 3 to 15 gpm (11.4 to 56.8 l/m), including control valve (CV) and pressure-regulating filter (PRF).
   1. Control Valve (CV) component specifications include:
      a. Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/ultra-violet resistant materials.
      b. One unit diaphragm constructed of durable Buna-N rubber with a clog resistant metering orifice.
      c. Inlet pressure rating of 15 to 150 psi (1.0 to 10.3 bar).
   2. Pressure Regulating Filter (PRF) component specifications include:
      a. Compact "Y" filter body and cap configuration constructed of glass-filled, ultra-violet resistant polypropylene, with 150 psi (10.3 bar) operating pressure rating.
      b. 200 mesh (75 micron) filter screen constructed of stainless steel.
      c. Normally-open pressure regulating device with preset outlet pressure of 40 psi (2.8 bar).
   3. Regulated pressure of 40 psi (2.8 bar).
C. Low flow control zone kit for drip zones with flows from 0.2 to 5.0 gpm (0.8 to 18.9 l/m), including Low Flow Valve (LFV) and Pressure-Regulating Filter (PRF).
   1. Low flow valve (LFV) component specifications include:
      a. Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/ultra-violet resistant materials.
      b. One unit diaphragm constructed of durable Buna-N rubber material with a clog resistant metering orifice.
      c. Inlet pressure rating of 15 to 150 psi (1.0 to 10.3 bar).
   2. Pressure regulating filter (PRF) component specifications include:
      a. Compact "Y" filter body and cap configuration constructed of glass-filled, ultra-violet resistant polypropylene, with 150 psi (10.3 bar) operating pressure rating.
      b. 200 mesh (75 micron) filter screen constructed of stainless steel.
      c. Normally-open pressure regulating device with preset outlet pressure of 30 psi (2.1 bar).
   3. Regulated pressure of 30 psi (2.1 bar).

POP-UP SPRINKLERS

A. Irrigation spray body for small turf areas (2.5-24 feet (0.8-7.3m) with a 30 psi (2.0 bar) pressure regulating device specifications include but are not limited to:
   1. Parts and components to withstand harsh operating conditions using chemically treated recycled water (reclaimed/non-potable), dirty water containing grit, debris, and other particulates, high operating pressures common in commercial irrigation and resistant to ultra-violet light.
   2. Pressure-activated, co-molded soft elastomer wiper seal composed of three wipers and a base seal to ensure a positive seal without excess "flow-by" which enables more heads to be installed on the same valve.
   3. Recessed debris pockets located in the base of the spray body to prevent recirculation of harmful debris during operation.
   4. Shall include a check valve to prevent low head drainage of up to 14 feet (4.3 m); 6 psi (0.4 bar).
   5. Shall include technology built into the stem to prevent water loss and alert maintenance when a spray nozzle is removed.
   6. Flow by rating of 0 at 15 psi (1.0 bar) or greater, 0.5 gpm (0.1 m3/h; 0.03 l/s) otherwise.
   7. Shall include ½" (15/21) NPT female threaded bottom inlet.
   8. The spray body, stem, nozzle, and screen shall be constructed of heavy-duty and ultra-violet resistant plastic.
B. Irrigation spray body for small turf areas (2.5-24 feet (0.8-7.3m) with a 45 psi (3.1 bar) pressure regulating device specifications include but are not limited to:
   1. Parts and components to withstand harsh operating conditions using chemically treated recycled water (reclaimed/non-potable), dirty water containing grit, debris, and other particulates, high operating pressures common in commercial irrigation and resistant to ultra-violet light.
   2. Pressure-activated, co-molded soft elastomer wiper seal composed of three wipers and a base seal to ensure a positive seal without excess "flow-by" which enables more heads to be installed on the same valve.
   3. Recessed debris pockets located in the base of the spray body to prevent recirculation of harmful debris during operation.
   4. Shall include a check valve to prevent low head drainage of up to 14 feet (4.3 m); 6 psi (0.4 bar).
   5. Shall include technology built into the stem to prevent water loss and alert maintenance when a spray nozzle is removed.
   6. Flow by rating of 0 at 15 psi (1.0 bar) or greater, 0.5 gpm (0.1 m3/h; 0.03 l/s) otherwise.
   7. Shall include ½" (15/21) NPT female threaded bottom inlet.
   8. The spray body, stem, nozzle, and screen shall be constructed of heavy-duty and ultra-violet resistant plastic.

SPRAY NOZZLES

A. Fixed or variable arc matched precipitation rate spray nozzle for small turf areas (3-15 feet (.91-4.6 m), maximum 30 psi (2.1 bar) specifications include but are not limited to:
   1. Shall be constructed of ultra-violet resistant plastic.
   2. Shall contain a stainless steel flow and radius adjustment screw allowing up to 25% radius reduction.
   3. Nozzle shall have a precipitation rate that is matched across sets and patterns of spray nozzles up to 15 feet (4.6 m).
   4. Shall include color coding marking on top of nozzle for easy identification of spray radius.
B. Dual orifice fixed arc nozzle for small turf areas (5-15 feet (1.7-4.6 m), maximum 30 psi (2.1 bar) specifications include but are not limited to:
   1. Shall be constructed of ultra-violet resistant plastic.
   2. Shall contain a stainless steel flow and radius adjustment screw allowing up to 25% radius reduction.
   3. The nozzle shall have dual orifices for both in-close watering and standard pattern watering with a matched precipitation rate between sets and matched flow and with other matched precipitation rate fixed spray nozzles up to 15 feet (4.6 m).
   4. Shall include color coding marking on top of nozzle for easy identification of spray radius.
C. Multi stream rotating nozzle for small turf areas (8-24 feet (2.4-7.4m), maximum 55 psi (3.8 bar) specifications include but are not limited to:
   1. Shall be constructed of ultra-violet resistant plastic.
   2. Shall contain a stainless steel radius adjustment screw allowing reduction to 13 feet (4.0 m).
   3. Shall have a matched precipitation rate of 0.60 in/hr (15.2 mm/hr).
   4. Shall have a color coded radius reduction plug to allow for easy identification of fixed arc pattern.

ROTOR HEADS

A. Pop-up rotor sprinkler for medium turf areas (25-47 feet (7.6-14.3 m), maximum 75 psi (5.2 bar) specifications include but are not limited to:
   1. Shall have adjustable arc rotation of 40 to 360 degrees (0.7 to 6.3 rad) and reversing full circle rotation.
   2. Shall have a flow shut-off device that is integrated into the flow path of the sprinkler.
   3. Shall have a pressure-activated, multi-function wiper seal that protects internals from debris and assures positive pop-up and retraction.
   4. Shall contain additional o-rings and seals for extra protection in "gritty" water.
   5. Operating precipitation rate of 0.20 to 1.01 inches per hour (5 to 26 mm/h).
   6. Operating flow rate of 0.73 to 8.31 gpm (0.17 to 1.85 m3/h).
   7. The body, stem, nozzle, and screen shall be constructed of heavy-duty and ultra-violet resistant plastic.
   8. Shall include a 45 psi (3.1 bar) pressure regulating device to prevent high pressure misting to the nozzle stream.
   9. Shall include an internal check valve to prevent low head drainage of up to 7 feet (2.1 m) to prevent puddling, run-off and erosion.
   10. Shall include a set of twelve interchangeable nozzles, 8 nozzles with 25 degree (0.4 rad) trajectory and 4 low-angle nozzles with 10 degree (0.2 rad) trajectory.

FLEXIBLE SWING PIPE

A. Swing pipe specifications include but are not limited to:
   1. Swing pipe shall be flexible black tubing constructed of linear low density polyethylene material with a wall thickness of 0.098" (0.3 cm) with a nominal inside diameter of 0.49" (1.2 cm).
   2. Pipe shall be capable of a flow up to 8 gpm (0.5 l/s).

DRIPLINE

A. Distribution tubing specifications include but are not limited to:
   1. The blank tubing shall be manufactured from flexible polyethylene material with a wall thickness of 0.049" (1.2 mm), outside diameter of 0.634" (16.1 mm), and inside diameter of 0.536" (13.6 mm).
   2. The tubing shall be dual-layered (brown over black).

INLINE EMITTER DRIPLINE

A. Sub-surface inline emitter tubing specifications include but are not limited to:
   1. The tubing shall be manufactured from flexible polyethylene material with wall thickness of 0.049" (1.2 mm), outside diameter of 0.634" (16 mm), and inside diameter of 0.536" (13.6 mm).
   2. The tubing shall have factory installed pressure-compensating, inline emitters with a copper shield device installed every 12, 18, or 24 inches (30.5, 45.7, 61 cm) as indicated on construction drawings.
   3. Operating pressure range of 8.5 to 60 psi (0.6 to 4.1 bar).
   4. Operating emitter flow rates of 0.6 and 0.9 gph (2.3 l/hr and 3.5 l/hr).

DISTRIBUTION TUBING

A. ¼" distribution tubing for emitters and other devices specifications include but are not limited to:
   1. The blank tubing shall be extruded from ultra-violet resistant polyethylene resin materials with a wall thickness of 0.04" (1 mm), outside diameter of 0.250" (6.3 mm), and inside diameter of 0.170" (4.3 mm).
   2. Operating pressure range from 0 to 60 psi (0 to 4.1 bar).

EMITTERS

A. Point source emission device specifications include but are not limited to:
   1. The emitter shall be constructed of ultra-violet resistant acetyl materials.
   2. Shall have a pressure-compensating design to deliver a uniform flow throughout a pressure range of 15 to 50 psi (1.0 to 3.4 bar).
   3. Flow rates that range from 0.5 to 2 gph (1.89 to 7.57 l/h) at a pressure range of 15 to 50 psi (1.0 to 3.4 bar).

VALVE BOX

A. Valve boxes specifications include but are not limited to:
   1. Shall be made of structural foam HPDE resin that is resistant to ultra-violet light, weather, moisture and chemical action of soils.
   2. Lids shall be clearly marked with the words "IRRIGATION CONTROL VALVE" molded onto the top.
   3. Lid colors are available in black, green and purple designating non-potable water use.

PART 3 - EXECUTION

EXCAVATION

A. Stake pipe and equipment layout for Owner's review and approval. Review does not relieve installer from coverage problems due to improper placement after staking.
B. Excavate trenches for irrigation system pipe to provide minimum cover per plans and details.
C. Barricade trenches that are left open overnight.

INSTALLATION

A. General: Plans are diagrammatic. Proceed with installation in accordance with the following:
   1. Install stop and waste valves, backflow preventers, and other equipment required by local authorities according to laws and regulations in order to make system complete.
      a. Coordinate with the General Contractor the responsible for installing the backflow preventer and other irrigation items at the connection point.
      b. Coordinate with the General Contractor the for exact location of the irrigation connection point.
   2. Thoroughly flush main lines before installing automatic control valves, and laterals before installing sprinklers. Flush supply lines thoroughly before installing backflow preventers or other regulating devices.

B. Piping: Assemble all mainline and lateral lines in accordance with manufacturer's recommendations with no cul-de-sacs. Assure positive drainage.
C. Sleeves: General Contractor shall install sleeves before concrete/paving work.
   1. Sleeves should be a minimum two times the diameter of the pipe passing through them.
   2. General Contractor shall stub-up and flag sleeve locations for the Irrigation Contractors ease of locating.
   3. Sleeve locations shall be approximate to that shown on the Irrigation Plan.
D. Control Valves:
   1. Install one valve per valve box and provide 12 inches of expansion loop slack wire at all connections inside valve box.
E. Manual Drains:
   1. Install per manufacturer's recommendations on upstream and downstream side of backflow preventers and at lowest point along main pressure pipe.

F. Quick-Coupling Valves:
   1. Install using 1 inch PVC nipples and schedule 40 ells as detailed. Location as indicated on plans.
G. Backflow Preventer:
   1. Install assembly complete for irrigation system with 2 drain valves and 2 shut off valves per detail, local laws and regulations, and per manufacturer's specifications.
   2. Install assemblies with drain valves in below grade installations. Provide open box floor with gravel drain sump.
H. Valve Boxes
   1. Install over all remote control valves, manual control valves, zone shutoff valves, gate valves, or globe valves. Size to provide adequate room for maintenance.
   2. Install boxes on level subgrade with proper drainage so that top of boxes are flush with finish grade material (sod, mulch, rock, etc.). Place parallel or perpendicular to adjacent curbs, sidewalks, or driveways.
   3. Place washed gravel aggregate in sump as shown on details.
I. Automatic Controller
   1. Properly ground controller per local laws and regulations. Make all control wire connections to automatic controller. Coordinate controller installation with other electrical work.
   2. Connect remote control valves to controller in numerical sequence as shown on Plans.

J. Wire and Electrical Work
   1. Use electrical control and ground wire suitable for sprinkler control cable.
   2. Provide 120-volt power connection (by others) to automatic controller to conform to local codes, ordinances and authorities having jurisdiction.
   3. Low Voltage Wiring:
      a. Bury control wiring between controller and electric valves in pressure supply line trenches, strung as close as possible to main pipe lines with such wires to be consistently located below and to one side of the pipe, or in separate trenches.
      b. Bundle all 24-volt wires at 10-foot intervals and lay with pressure supply line pipe to one side of trench.
      c. Install control wire for each control valve.
      d. Run 2 spare #14-1 wires from controller pedestal or electric control valve on each and every leg of mainline.
K. Sprinkler Heads, Emitters, Rotators, and Rotors
   1. Flush circuit piping with full head of water and install sprinklers after hydrostatic text is completed.
   2. Adjust nozzles to allow for adequate coverage and to minimize overspray onto walks, roads, driveways, and buildings.
   3. Stake emitter tubing with 1/4" Rainbird® TS-025 tubing stakes.
   4. Adjust heads to be plumb and flush with finish grades, even with top of soil level or top of material level after completion of grading, seeding, sodding, and rolling of grass.
L. Drip Tubing
   1. Install all drip tubing in locations shown on the Irrigation Plan. To be laid out and installed per the irrigation drip details (sheet L-2.1).
   2. Install flush caps as indicated on details.
   3. Install drip indicator on all drip zones.
M. Thrust Blocks and/or Joint Restraints
   1. Install on pipe sized 2" or larger wherever the main pipe line:
      a. Changes any direction at tees, angles, and crosses vertical and horizontal.
      b. Changes at reducers.
      c. Stops at a dead-end.
      d. Valves at which thrust develops when closed.

BACKFILLING

A. Do not begin backfilling operations until system tests and approvals have been completed.
B. Bed all pipe a minimum of 2 inches. Backfill to 6 inches above pipe with soil free of rocks over 1-inch diameter, debris, or organic matter. Backfill remainder of trench with soil of like quality to adjacent areas. Haul away all material not suitable for backfill.
C. Compact backfill in 6-inch lifts thoroughly to prevent settling damage to grades or plant material. Leave trenches slightly mounded to allow for settlement after backfilling is completed. Low areas and damage caused by settling will be repaired by Contractor at no additional cost to the Project or Owner.
D. Prevent soil, rocks, or debris from entering pipes or sleeves.

FLUSHING AND TESTING

A. Flushing: After piping, risers, and valves are in place and connected, but prior to installation of sprinkler heads, thoroughly flush piping system under full head of water pressure from dead end fittings. Maintain flushing for 5 minutes through furthermost valves. Cap risers after flushing.

INSPECTION

A. Arrange for Owner's presence 48 hours in advance of inspection walk-through.
B. Examine areas and conditions under which work of this section is to be performed and ensure a complete and operating installation prior to scheduling a walk-through.
C. Operate each zone in its entirety for Owner at time of walk-through and open all valve boxes as directed.
D. Expose all drip emitters under operations for observation by Owner to demonstrate they are performing and installed as designed prior to placing of mulch material. Schedule separate walk-through as necessary.
E. As necessary Owner will generate a list of items to be corrected prior to Final Acceptance.

RESTORATION AND CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.
B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.
C. Restore all damaged areas to original condition unless otherwise shown on plans at no additional cost to the Project or Owner.

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REVISION SCHEDULE

NO.	DATE	DESCRIPTION
2.	3.9.22	City Comments
3.	3.15.22	New Site Plan
4.	3.15.22	Issued for Bid

MLD PROJECT #	2021108
PRINTED FOR	FOR BID
DATE	5.28.21
DRAWN BY	MB

FOR BID

SHEET
Irrigation Specifications

SHEET NUMBER
L-202