



CITY OF DELRAY BEACH
100 N.W. 1st AVENUE, DELRAY BEACH, FL 33444

Solicitation Addendum

Addendum No.: 1

Solicitation No.: 2019-027

Project No.: 17-010 (16-095)

Solicitation Title: Seacrest Blvd. from NW 22nd Street to Gulfstream Blvd.

Addendum Date: March 13, 2019

Purchasing Contact: Ryan Lingholm, LingholmR@mydelraybeach.com

THIS ITBC IS HEREBY AMENDED AS SET FORTH HEREIN BELOW. THIS ADDENDUM NO. 1 IS HEREBY INCORPORATED IN AND MADE A PART OF ITBC NO. 2019-027.

DELETE:

The following section is hereby deleted in its entirety:

~~SECTION 2.17 COMPLETION OF WORK FROM DATE OF PURCHASE ORDER~~

~~The Bidder shall state in its offer the number of calendar days from the date of the Notice to Proceed in which it will guarantee to complete the Work.~~

REVISE:

The following section is hereby revised as follows:

SECTION 3.1, PARAGRAPH 2

The Northeast 2nd Avenue / Seacrest Beautification projects initiated in response to the requests from the Del Ida Park Neighborhood Community for a more aesthetically pleasing streetscape that addressed pedestrian and bicyclist safety along a main corridor leading directly into downtown Delray Beach. The City of Delray Beach and Delray Beach CRA have acknowledged the need for beautification and other necessary improvements through the development of the

Seacrest/Del-Ida Park Neighborhood Plan which was adopted by the City Commission on March 3, 1998. The City's Bicycle/Pedestrian Plan as well as the ~~Metropolitan Planning Organization (MPO) Transportation Planning Agency (TPA)~~ (formerly called the Metropolitan Planning Organization (MPO)) Master Comprehensive Bicycle Transportation Plan also recommends the provision for bicycle facilities along the NE 2nd Avenue (Seacrest) corridor. As a result, the Seacrest Beautification projects will provide for and/or increase the use of pedestrian and bicycle facilities, while creating an appropriately improved streetscape within a highly visible neighborhood.

REVISE:

The following section is hereby revised as follows:

SECTION 5.1 MINIMUM QUALIFICATIONS, (b)

Bidder must hold a Florida State 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 contract.~~ **Provide proof, in the form of a copy of license(s), that the Bidder is certified under Section 489.119, Florida Statutes, to engage in contracting through a certified or registered general contractor or a certified or registered building contractor as the qualifying agent.**

REVISE:

Exhibit B Technical Specifications, Section 3.22, Bid Item No. 26 (A) is hereby revised as follows:

Payment for this item shall be made at the Contractor's unit price per Each (EA) bus stop installed and accepted. The Contractor's unit price shall include full compensation for furnishing and installing the concrete pad, curbing, ~~benches, trash receptacle, and structures and landing~~. Bus stop design and dimensions shall be constructed per Palm Beach County standards at the locations shown on the Drawings.

REVISE:

Exhibit B Technical Specifications, Section 3.24, Bid Item No. 28 (B) is hereby revised as follows:

Payment For furnishing and installing drainage catch basin structures shall include compensation for labor, material and equipment required to install the manholes, TYPE P bottom, and TYPE P-5 top, frames, grates, covers, handrails, and appurtenances in accordance with the plans and specifications including all excavation, dewatering and backfilling. This item includes, grout, removal of existing drainage pipe necessary to install drainage structure, flushing the

existing adjacent drainage pipes, and all restoration (sod, irrigation repair, etc.) to complete the work.

REVISE:

Exhibit B Technical Specifications, Section 3.25, Bid Item No. 29 (A) is hereby revised as follows:

Payment for this item shall be made per Each (EA) structure modified. The Contractor's unit price shall include full compensation for all removal and adjusting of drainage structure frame and grates to proposed grade, concrete and pavement inlet aprons, and lining the existing structures, installation of proposed structure tops, and handrails as required, in accordance with the FDOT specifications, as noted in the plans.

REVISE:

Exhibit B Technical Specifications, Section 3.28, Bid Item No. 32 is hereby retitled as follows:

3.28 PAVER BRICK (CROSSWALK & TRAFFIC SEPARATOR) - Bid Item Nos. 32

REVISE:

Exhibit B Technical Specifications, Section 3.31, Bid Item No. 37 is hereby revised as follows:

Payment for furnishing and installing pipe at the various depths will be made at the Contractor's Lump Sum (LS) for the pipe and shall include all necessary labor and materials for furnishing and laying of the conduit, 17"x30" pull box, dewatering if required, and excavation of any type including rock, backfilling, and clean-up.

REPLACE:

Exhibit A Plans, Plan Sheet C.41

Plan Sheet C.41 is hereby replaced in its entirety with the attached revised Plan Sheet C.41. Revisions to this sheet are noted utilizing a revision cloud.

REPLACE:

Exhibit A Plans, Plan Sheet C.43

Plan Sheet C.43 is hereby replaced in its entirety with the attached revised Plan Sheet C.43. Revisions to this sheet are noted utilizing a revision cloud.

ADD:

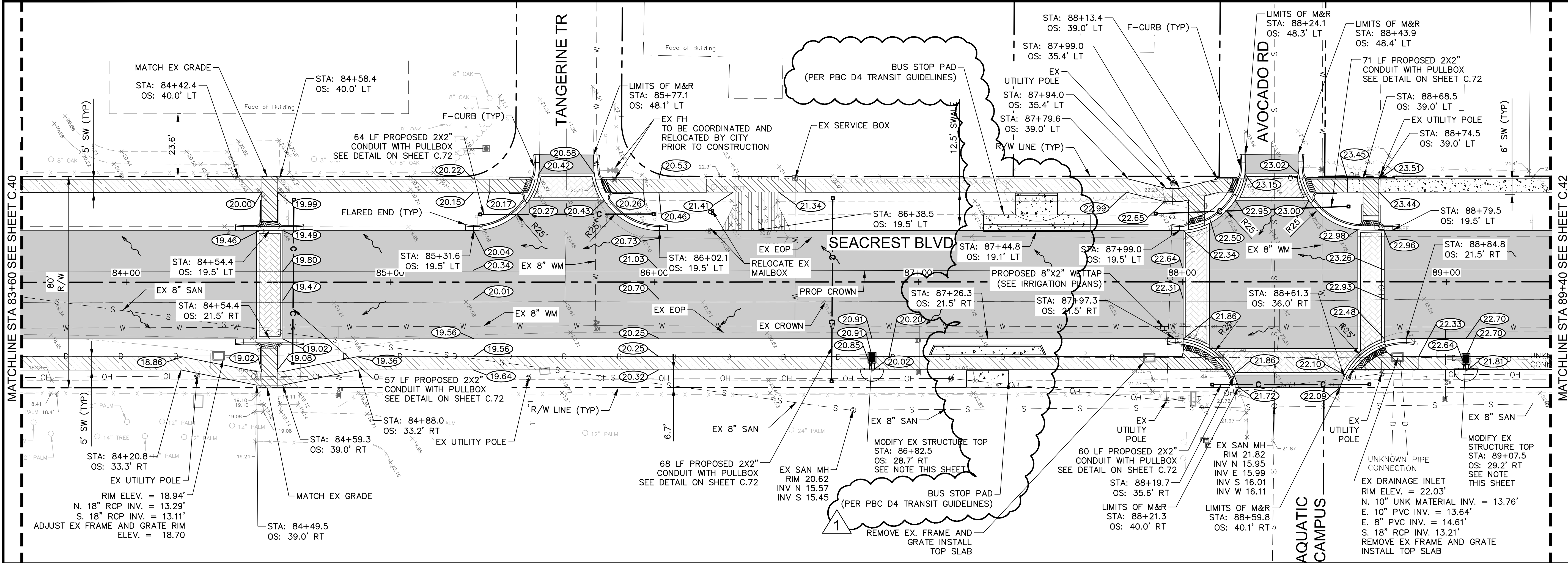
The attached document labeled "COLD IN-PLACE RECEYCLED BITUMINOUS MATERIAL SPECIFICATIONS" is hereby added to the end of Exhibit B Technical Specifications.

NOTE: Unless otherwise noted, items that are ~~struck through~~ are deleted. Items that are underlined have been added. All other terms and conditions remain as stated in this solicitation.

End of Addendum**INSTRUCTIONS:**

Receipt of this addendum must be acknowledged as instructed in the solicitation document. Failure to acknowledge receipt of this Addendum may result in the disqualification of Respondent's response.

Stephen Cherry C:\bentley\dwg\l\stephen\c0606203\17-0102-ROAD.dwg 24 17:20:19 8:28:20 AM Source: 3/11/2019 8:14:38 AM



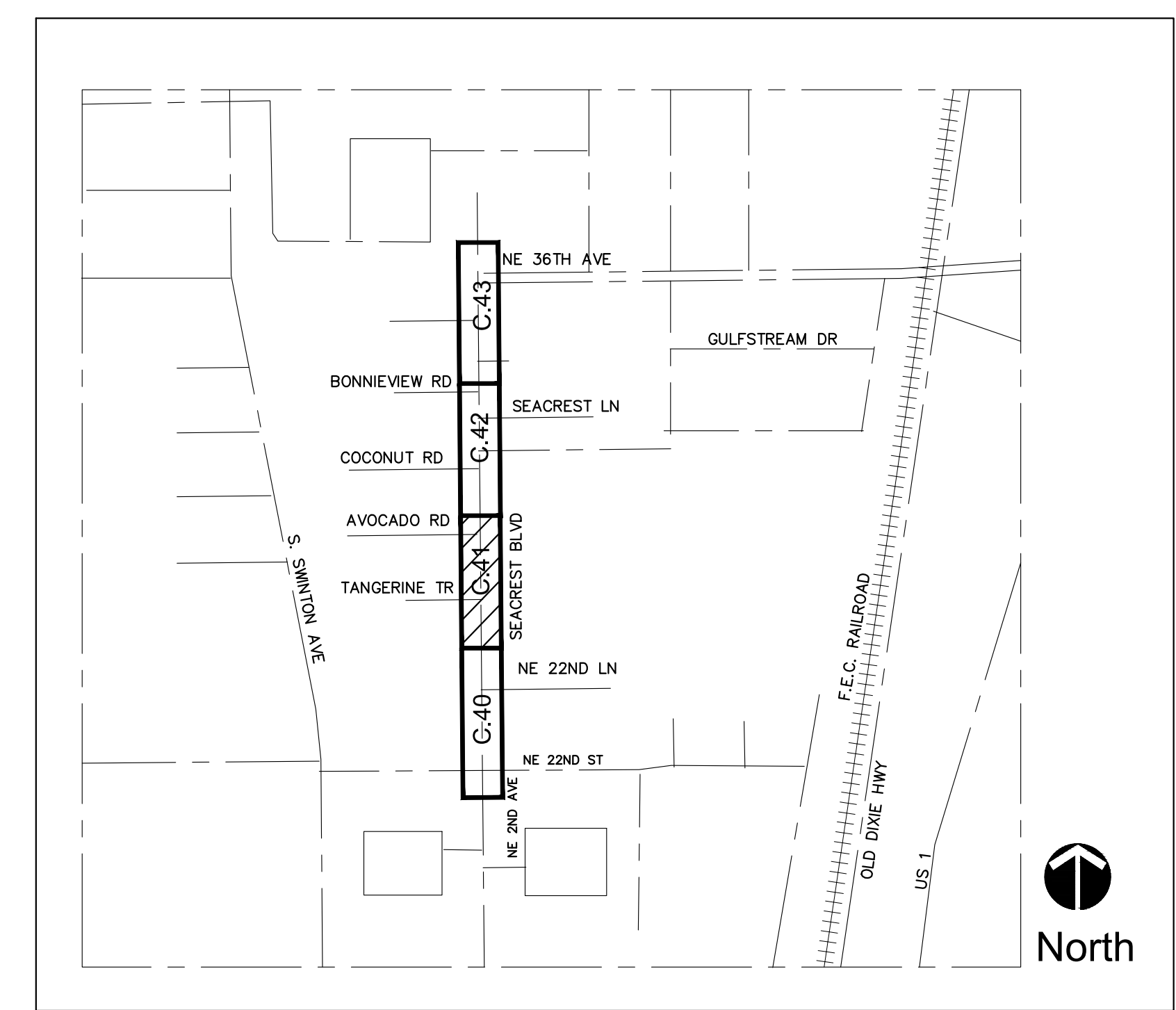
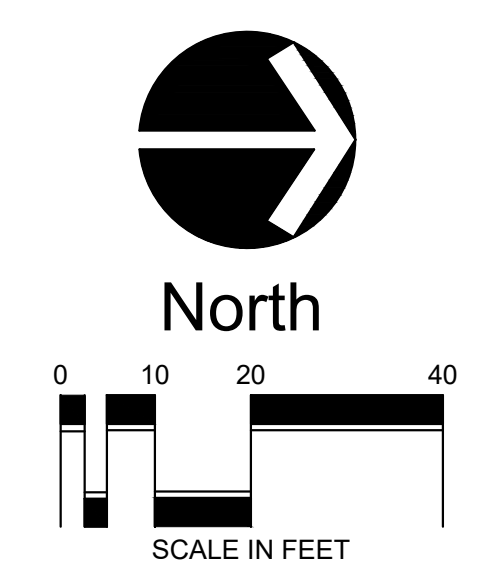
- ### NOTES
- SEE LANDSCAPE PLANS FOR REMOVAL/RELOCATION OF TREES, SHRUBS, AND ALL OTHER LANDSCAPING CONFLICTS.
 - ALL DETECTABLE BRICK PAVERS SHALL BE COLOR "BRICK RED".
 - CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
 - REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES, CHAPTER 3, TABLE 3-12.
 - CONTRACTOR RESPONSIBLE TO REPLACE ALL TRAFFIC LOOPS.
 - THE CONTRACTOR SHALL COORDINATE BUS STOP CONSTRUCTION WITH PALM BEACH COUNTY.
 - ANY STEEL INCORPORATED INTO THIS PROJECT SHALL CONFORM TO BUY AMERICA PROVISION 23 CFR 635.410.
 - ALL WORK FOR THIS PROJECT WILL BE COMPLETED WITHIN AND FROM THE EXISTING RIGHT OF WAY.
 - THE DESIGN SPEED FOR THIS ROAD IS 35 MPH.
 - THE CEI SHALL BE RESPONSIBLE FOR COORDINATING THE REMOVAL OF PRIVATE LANDSCAPE AND ABOVE GROUND APPURTENANCES BEFORE CONSTRUCTION BEGINS.
 - SEE SHEET C.73 FOR DRAINAGE STRUCTURE SECTIONS.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING SUBSURFACE UTILITIES, PROTECTING, AND REPAIRING ANY DISTURBED UTILITIES.

LEGEND

EX ELEVATION	~ x 0.00
DIRECTION OF FLOW	→
EX STREET/STOP SIGN	⊕
EX BACKFLOW PREVENTER	⊗
EX BOLLARD	⊙
EX CLEANOUT	⊖
EX FIRE HYDRANT	⊕
EX FLOOD LIGHT	⊕
EX GATE VALVE	⊕
EX SANITARY MANHOLE	⊕
EX METER WATER/ELECTRIC	⊕
EX MAILBOX	⊕
EX POWER POLE	⊕
EX DRAINAGE	— D —
EX OVERHEAD LINES	— OH —
EX SANITARY	— S —
EX TELEPHONE	— BT —
EX WATERMAIN	— W —
PROPOSED CONDUIT WITH 2 PULL BOXES (FOR FUTURE LIGHTING)	— C —
PROP. 4" THICK CONCRETE (REMOVE & CONSTRUCT)	▨
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)	▩
PROP. 6" THICK CONCRETE (SIDEWALK)	▨
PROP. 6" THICK CONCRETE (DRIVEWAY)	▩
PROP. SWALE REGRADING	▨

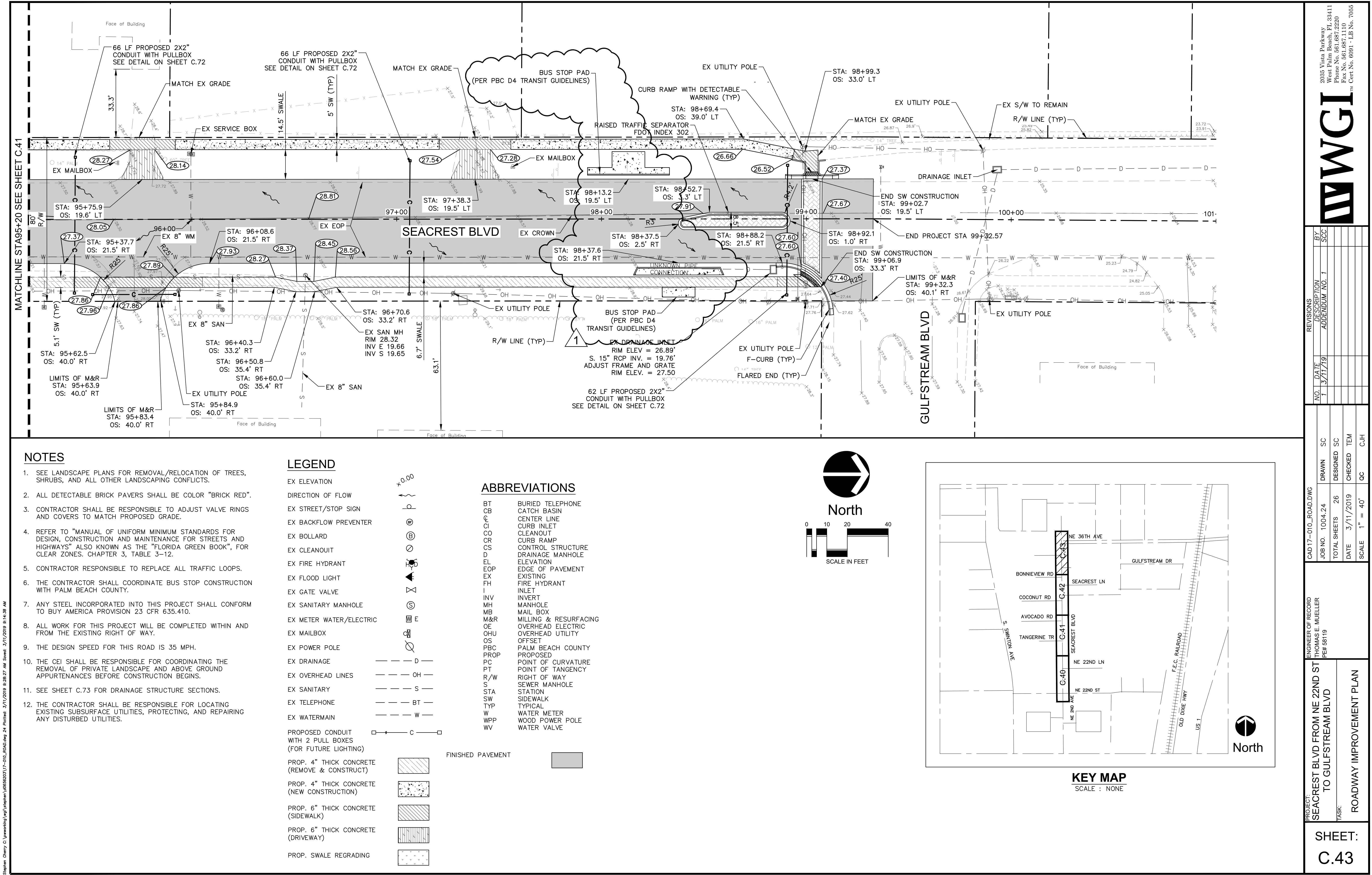
ABBREVIATIONS

BT	BURIED TELEPHONE
CB	CATCH BASIN
CL	CENTER LINE
CI	CURB INLET
CO	CLEANOUT
CR	CURB RAMP
CS	CONTROL STRUCTURE
D	DRAINAGE MANHOLE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EX	EXISTING
FI	FIRE HYDRANT
I	INLET
INV	INVERT
MH	MANHOLE
MB	MAIL BOX
M&R	MILLING & RESURFACING
OE	OVERHEAD ELECTRIC
OHU	OVERHEAD UTILITY
OS	OFFSET
PBC	PALM BEACH COUNTY
PROP	PROPOSED
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
R/W	RIGHT OF WAY
S	SEWER MANHOLE
STA	STATION
SW	SIDEWALK
TYP	TYPICAL
W	WATER METER
WPP	WOOD POWER POLE
WV	WATER VALVE



KEY MAP
SCALE : NONE

WGI 2005 Vista Parkway West Palm Beach, FL 33411 Phone No. 561.687.2220 Fax No. 561.687.1110 Cert No. 6091 - LB No. 7055	REVISIONS		BY	
	NO.	DATE	DESCRIPTION	SCC
	1	3/11/19	ADDENDUM NO. 1	
CAD 17-010-ROAD.DWG	DRAWN	SC	DESIGNED	SC
	JOB NO. 1004-24			
	TOTAL SHEETS 26			
	DATE 3/11/2019	CHECKED	TEM	
ENGINEER OF RECORD THOMAS E. MUELLER PE# 85119	PROJECT SEACREST BLVD FROM NE 22ND ST TO GULFSTREAM BLVD		TASK ROADWAY IMPROVEMENT PLAN	
	SHEET: C.41			



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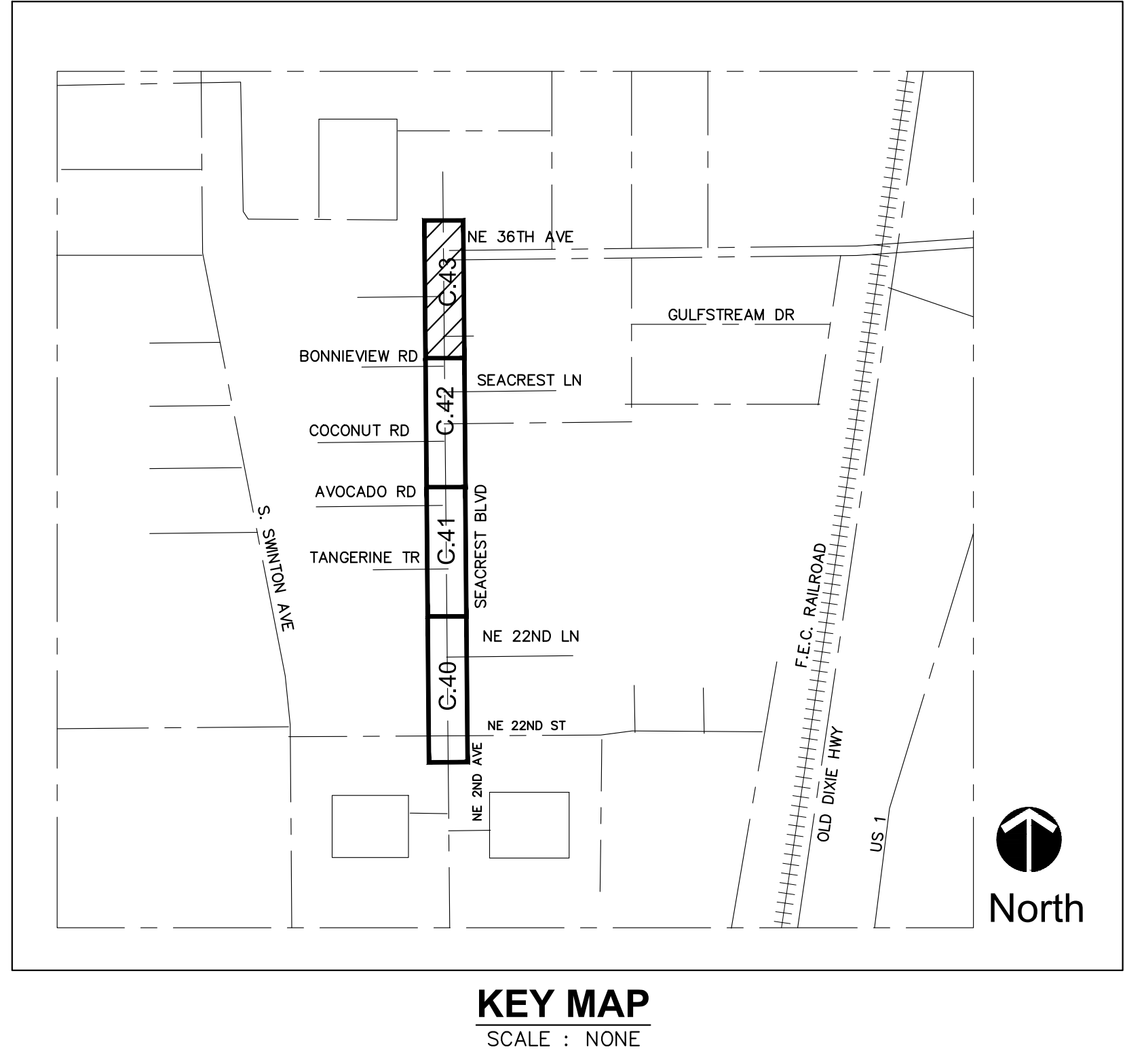
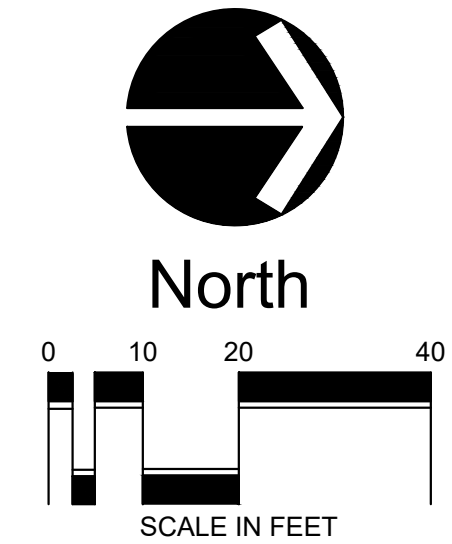
LEGEND

EX ELEVATION	+	0.00
DIRECTION OF FLOW	→	
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EX BACKFLOW PREVENTER	⊗	
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FINISHED PAVEMENT



2005 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091 - LB No. 7055

NO.	DATE	DESCRIPTION	BY	SC
1	3/11/19	ADDENDUM NO. 1		

DRAWN	SC	DESIGNED	SC	CHECKED	TEM	QC	CJH
1004.24		26		3/11/2019			

SCALE 1" = 40'

CAD: 17-010.ROAD.DWG

ENGINEER OF RECORD
THOMAS E. MUELLER
PE# 58119

PROJECT: SEACREST BLVD FROM NE 22ND ST TO GULFSTREAM BLVD

TASK: ROADWAY IMPROVEMENT PLAN

SHEET: C.43

COLD IN-PLACE RECYCLED BITUMINOUS MATERIAL SPECIFICATIONS

The work specified in this Technical Provision consists of the in-place construction of a Cold Recycled Bituminous Base Course, using either reclaimed asphalt pavement (RAP) material and/or reclaimed aggregate material (RAM), combined with virgin aggregates and/or bituminous material. It is the intent of this contract to recycle 100% of the existing asphalt pavement to ensure that the completed recycled base course will be of a consistent material and thickness throughout, including, but not limited to, all existing asphalt pavement adjacent to all concrete curbing, storm sewer inlets, manholes, sanitary sewer manholes, and all utility valve boxes. The existing asphalt pavement in the above-described locations must be included in the recycling process in order to construct a bituminous base course with a uniform thickness throughout 100% of the proposed area. The intent of this contract is to utilize the specified process which is clearly defined within this specification. Therefore Full Depth Reclamation or any variation of Full Depth Reclamation will not be accepted.

Materials:

Asphalt Emulsion:

The type of asphalt emulsion to be used shall be determined by the mixture design. Bituminous material shall conform to the applicable requirements of the *2010 FDOT Standard Specifications for Road and Bridge Construction, Section 916*. At the request of the county, a representative from the asphalt emulsion supplier shall be available at the job site to monitor the characteristics and performance of the asphalt emulsion. Throughout the job, the representative will monitor the project and make adjustments to the asphalt emulsion formulation as required.

Portland Cement: When a blend of asphalt emulsion and Portland cement is specified the Portland cement shall be type I or II and conform to the latest standard requirements of ASTM C150 and AASHTO M85. If cement is added with emulsion no more than 4% shall be used on the project unless approved by the Engineer.

Cold Pulverized Material:

The cold pulverized recycled asphalt pavement (hereinafter referred to as RAP) material shall meet the following gradation requirement prior to the addition of the asphalt emulsion.

STANDARD		METRIC	
Sieve Size	%Passing	Sieve Size	%Passing
2"	95	51 mm	95

Mixture Design:

A mix design(s) conducted by an independent, accredited laboratory using materials obtained directly from the project site, conforming to the requirements of this Technical Specification shall be submitted to the City at the Pre-Construction Conference. Based on RAP consistency throughout project limits, more than one mix design may be required. A traffic control plan may be required in accordance with TP-102 for collecting materials. Mix design formulations shall be conducted in accordance with the following guidelines:

Mix Design Procedures for CIR (Cold In-place Recycling) Material

- **Sampling and Processing** - Prior to materials sampling in the roadway, obtain approval from the County. A traffic control plan may be required in accordance with TP-102 for collecting materials. Obtain 6" minimum inside diameter cores from the areas to be recycled. If cores show significant differences in various areas, such as different type or thickness of layers between cores, then separate mix designs shall be performed for each of these pavement segments. It is recommended that a minimum of one location be sampled for each 1000' in each lane. Additionally, samples should be taken where visual differences in the pavement are noticed. Immediately patch all core holes neatly with asphalt cold patch. Cores shall be cut in the laboratory to the depth specified for the CIR project. Cores shall be crushed in the laboratory.

The mix design shall be performed on this crushed sample. Gradation of the sample after crushing shall be determined by ASTM C117 and C136 (dried at no greater than 40°C). Samples shall be prepared with a sample splitter. An alternative method is to dry, screen and recombine the sample in the laboratory to target gradation.

- **Mixing** - Calculate the amount of RAP required to produce a 61.0 mm to 66.0 mm (2.4 to 2.6 inch) tall specimen by determining the maximum specific gravity of the RAP in accordance with ASTM D2041.

Number of specimens: 4 per emulsion content for a total of 4 for long-term stability and 4 for moisture testing for the 3 emulsion contents. Two specimens are required for Rice specific gravity; test at the highest emulsion content in the design and back calculate for the lower emulsion contents.

Recommended emulsion contents: 2.0%, 2.5%, 3.0%, 3.5%. Choose three emulsion contents that bracket the estimated recommended emulsion content.

Add moisture that is expected to be added at the milling head, typically 1.5 to 2.5 percent.

If any additives are in the mixture, introduce the additives in a similar manner that they will be added during field production.

Mixing of test specimens shall be performed with a mechanical bucket mixer. Mix the CIR RAP millings thoroughly with water first, then mix with emulsion. Mixing shall occur at ambient temperature. One specimen shall be mixed at a time. Mixing time with emulsion should not exceed 60 seconds.

- **Compaction** - Specimens shall be compacted immediately after mixing. Place paper disks on the top and bottom of the specimen before compaction. Specimens shall be compacted with a Superpave gyratory compactor (SGC) in a 100 mm mold at 1.25° angle, 600 kPa ram pressure, and 30 gyrations. The mold shall not be heated.
- **Curing after compaction** - Extrude specimens from molds immediately after compaction. Carefully remove paper disks.

Place specimens in 60°C forced draft oven with ventilation on sides and top. Place each specimen in a small container to account for material loss from the specimens. Care should be taken not to

over-dry the specimens. Cure compacted specimens to constant weight but no more than 48 hours and no less than 16 hours. Constant weight is defined here as 0.05% change in weight in 2 hours. After curing, cool specimens at ambient temperature a minimum of 12 hours and a maximum of 24 hours.

- **Measurements** - Determine bulk specific gravity (density) of each compacted (cured and cooled) specimen according to ASTM D2726.

Determine specimen heights according to ASTM D3549 or equivalent. Alternatively, the height can be obtained from the SGC readout.

Determine Rice (maximum theoretical) specific gravity, ASTM D2041, except as noted in Item 4 of this procedure, and do not break any agglomerates which will not easily reduce with a flexible spatula. Perform the supplemental dry-back procedure to adjust for uncoated particles.

Determine percent air voids in accordance with ASTM D3203 for each design emulsion content.

Determine corrected Marshall Stability by ASTM D1559 at 40°C after 2 hour temperature conditioning in a forced draft oven.

- **Moisture Susceptibility** - Perform same conditioning and volumetric measurements on moisture-conditioned specimens as on other specimens. Vacuum saturate to 55 to 75 percent, soak in a 25°C water bath for 23 hours, followed by a one hour soak at 40°C. Determine corrected Marshall Stability. The average moisture conditioned specimen strength divided by the average dry specimen strength is referred to as retained stability.
- **Emulsion Content Selection** - The properties of the specimens at design emulsion content shall meet the properties in Table 1.
- **Report** - The report shall contain the following minimum information: Gradation of RAP; amount and gradation of virgin aggregate or additional RAP, if any; recommended water content range as a percentage of dry RAP; optimum emulsion content as a percentage of dry RAP and corresponding density; air void percentage; absorbed water percentage; Marshall Stability and Retained Stability at design moisture and emulsion contents; Raveling percentage; and Thermal Cracking initiation temperature. Include the mix design emulsion designation, supplier name, plant location, and emulsion testing results detailed in *Table 4*.

The mix design(s) shall meet the Mix Design Performance Criteria of *Table 1* and be approved by the County prior to construction.

<i>Table 1 – Mix Design Performance Criteria</i>		
<i>100 mm specimens shall be prepared in a Superpave Gyratory compactor. The mixture should meet the following criteria at the selected design asphalt emulsion content:</i>		
<i>Property</i>	<i>Criteria</i>	<i>Purpose</i>
Compaction effort, Superpave Gyratory Compactor AASHTO T312	1.25° angle, 600 kPa stress, 30 gyrations	Density Indicator

Density, ASTM D2726 or equivalent	Report	Compaction Indicator
Gradation for Design Millings, ASTM C117	Report	
*Marshall stability, ASTM D6926-10, D6927-06, 40°C	2500 lbs. minimum stability	Stability Indicator
**Resistance of Compacted Bituminous Mixture to Moisture Induced Damage AASHTO T283-07 Retained stability based on cured stability	70 % min.	Ability to withstand moisture damage
<i>* Cured stability tested on compacted specimens after 60°C (140°F) curing to constant weight.</i>		
<i>**Vacuum saturation of 55 to 75 percent, water bath 25°C 23 hours, last hour at 40°C water bath</i>		

Other Additives:

If necessary, additives may be used to meet the requirements in Table 1. In the case that an additive is used, the type and allowable usage percentage must be described in the submitted design recommendation.

Addition of Imported Crushed Reclaimed Asphalt Pavement (RAP) material:

If available, imported RAP material may be added at the discretion of the City Engineer if the RAP material meets the requirements in *Table 2*. The crushed RAP shall be free from vegetation and all other deleterious materials, including silt and clay balls. It shall meet the requirements for Deleterious Materials given in *Table 2*. The crushed RAP shall not exceed the maximum size requirement in this Technical Specification and when blended with the design millings, shall produce a product which meets the specifications given in *Table 1*.

Table 2 - Imported Crushed RAP Criteria		
Property	Method	Limit
Deleterious Materials: Clay Lumps and Friable Particles in Aggregate, %	ASTM C 142 or AASHTO T112	0.2% maximum
Maximum size and Distribution	ASTM C 136 or AASHTO T 27	5% retained on 2" seive

Additional Aggregate:

Based on the results of mix design testing or other

requirements, the CIR contractor shall determine if additional aggregate is required to comply with mix design performance criteria specified in *Table 1*. Any additional aggregate shall meet the criteria specified in *Table 3*, and it shall be graded to produce a pavement layer which meets the mix design performance criteria specified in *Table 1*.

Table 3 - Additional Aggregate Criteria		
Property	Method	Limit
Los Angeles abrasion value, % loss	AASHTO T96	40% maximum
Sand Equivalent,%	ASTM D2419	60% minimum
Maximum size and Distribution	ASTM C 136 or AASHTO T 27	Section 334-2.2
Water absorption %	AASHTO T 85	5% maximum

Equipment:

Maintain all equipment in a satisfactory operating condition and in accordance with the *2010 FDOT Standard Specifications for Road and Bridge Construction, Section 100-2*.

The Cold In-Place Recycling shall be conducted with the equipment specified herein.

Milling Machine:

A self-propelled, bi-directional, down-cutting, lateral/horizontal mixing, cold milling machine capable of pulverizing the existing asphalt (and base material as needed) in a single pass to the depth shown on the plans will be required. The machine shall have automatic depth controls to maintain the cutting depth to within $\pm \frac{1}{4}$ in (6 mm) of that shown on the plans, and shall have a positive means for controlling cross slope elevations. A 30 foot non-contact averaging beam must be used on the mill. The use of a heating device to soften the pavement will not be permitted. Up-cutting machines shall not be permitted. Machines that only provide vertical mixing will not be permitted.

The milling machine must be equipped with a liquid metering device capable of adjusting the flow of asphalt emulsion to compensate for any variation in the speed of the machine. The metering device shall deliver the amount of asphalt emulsion to within ± 0.2 percent of the required design amount by weight of pulverized bituminous material (for example, if the design requires 3.0 percent, the metering device shall maintain the emulsion amount between 2.8 percent and 3.2 percent). The asphalt emulsion pump should be of sufficient capacity to allow emulsion contents up to 3.5% by weight of pulverized bituminous material. Also, automatic digital readings will be displayed for both the flow rate and total amount of pulverized bituminous material and asphalt emulsion in appropriate units of weight and time.

Bituminous Paver:

A self-propelled high density paver having tamper bar compaction, electronic grade and cross slope control for the screed shall be utilized. The equipment shall be of sufficient size and power to spread and lay the mixture in one smooth continuous pass to the specified section and according to the plans. A 30 foot non-contact averaging beam must be used on the bituminous paver. To reduce material segregation, the bituminous paver must utilize a hopper insert.

Rollers:

All rollers shall be self-propelled. The number, weight and types of rollers shall be as necessary to obtain the required compaction. At least one pneumatic-tired roller shall have a minimum gross operating weight of not less than 50,000 lbs. (22,600 kg). Pneumatic rollers must have properly working scrapers and water spraying systems. At least one double drum vibratory steel-wheeled roller shall have a gross operating weight of not less than 20,000 lbs. (9,000 kg) and a width of 78 inches (1980 mm). Double drum vibratory rollers must have properly working scrapers and water spraying systems.

Cement Delivery Equipment:

A calibrated screw-type distributor capable of spreading 25 tons at one time before being reloaded, shall be used with a curtain to accurately place the amount of cement required by the mix design onto the roadbed for mixing.

Experience:

All contractors and their subcontractors shall be FDOT prequalified. Bidders must submit with the bid a minimum of five CIR project references from a City or County in the State of Florida, that have been completed within the past three years. Bidders may be required to submit detailed information regarding

the staff that they propose for this project. Contractor shall be capable of meeting all the requirements of this specification at the time of the bid. Staff shall have the option to inspect the Contractor's equipment and if found deficient, it shall be the basis for rejection of Contractor's bid.

Construction:

Removal of Vegetation:

Grass, vegetation and other deleterious material shall be removed from the edge of the existing pavement to prevent contamination of the pulverized bituminous material during the milling operation.

Milling:

The existing pavement shall be milled to the required depth and width as indicated on the plans. Recycling shall be in a manner that does not disturb the underlying material in the existing roadway. The milling operation shall be conducted so that the amount of fines occurring along the vertical faces of the cut will not prevent bonding of the cold recycled materials. Use a small milling machine, if necessary, to mill longitudinally to the required depth as indicated on the plans along all curbs and gutters, radius returns, utilities, inlets, around all manholes and any other structures not accessible or practical to be milled by the milling/mixing machine utilities. The millings produced by the small mill will be the same as the large mill and of equal gradation to produce a uniform recycled pavement layer. Inlets/Catch Basins must be covered during the milling and recycling operation to prevent milled material from entering the catch basin area where it could contaminate and/or block the storm water system.

Processing:

When a paving fabric is encountered during the CIR operation, the Contractor shall make the necessary adjustments in equipment or operations so that at least ninety percent (90%) of the shredded fabric in the recycled material is no more than 5 in² (3200 mm²). Additionally, no fabric piece shall have any dimension exceeding a length of 4 inches (100 mm). These changes may include, but not be limited to, adjusting the milling rate and adding or removing screens in order to obtain a specification recycled material. The Contractor shall be required to waste material containing over-sized pieces of paving fabric as directed by the Engineer.

Spreading:

The material shall be spread using a self-propelled paver meeting the requirements under *2010 FDOT Standard Specifications for Road and Bridge Construction, Section 320-5*. Heating of the paver screed will not be permitted. The recycled material shall be spread in one continuous pass, without segregation and to the lines and grades established by the Engineer.

Compaction:

Compaction of the recycled mix shall be completed using rollers meeting the requirements of the *2010 FDOT Standard Specifications for Road and Bridge Construction Section 330-10*. During initial construction, rolling patterns and sequences shall be established through the construction of a control strip produced with the CIR equipment and within the pavement section, to determine the target wet density, using a nuclear moisture-density gauge in accordance with ASTM D2950, backscatter measurement mode. In all cases, the longitudinal joint must first be rolled followed by the rolling pattern established by the test strip. The initial pass for the rolling pattern established by the test strip should begin on the low side and progress to the high side by overlapping of longitudinal passes parallel to the pavement centerline. Initial rolling should not begin until the emulsion has started to break. Rollers shall be operated at speeds appropriate for the type of roller and necessary to obtain the required degree of compaction and prevent defects in the mat. Rolling shall be continued until no displacement is occurring or until the pneumatic

roller(s) is (are) walking out of the mixture. Final rolling to eliminate pneumatic tire marks and to achieve density shall be done by double drum steel roller(s), either operating in a static or vibratory mode. Vibratory mode should only be operated at a speed, frequency and amplitude shown not to damage the pavement. The selected rolling pattern shall be followed unless changes in the recycled mix or placement conditions occur and the established rolling pattern is causing damage to the mat or the required degree of compaction is unachievable. These circumstances require the establishment of new rolling patterns and sequences through the construction of a control strip produced with the CIR equipment and within the pavement section. Rolling shall start no more than 30 minutes behind the paver. Finish rolling shall be completed no more than one hour after milling is completed. When possible, rolling shall not be started or stopped on uncompacted material but with rolling patterns established so that they begin or end on previously compacted material or the existing pavement.

Return of Traffic:

After the completion of compaction of the recycled pavement layer, no traffic shall be permitted on the completed recycled material for at least one (1) hour. After one hour rolling traffic may be permitted on the recycled material. This time may be adjusted by the contractor to allow establishment of sufficient cure so traffic will not initiate raveling. After opening to traffic, the surface of the recycled pavement layer shall be maintained in a condition suitable for the safe movement of traffic.

Protection and Damage:

Protect the recycled pavement layer in accordance with the *2010 FDOT Standard Specifications for Road and Bridge Construction, Section 330-13*. After the base course has been finished as specified herein, it shall be protected against drying for a period of 2 to 3 days by the application of a prime coat as specified in FDOT Standard Specifications section 300 at a rate of not less than 0.15 gal/sy. The curing method shall begin as soon as possible, but no later than 24 hours after the completion of finishing operations. The finished base course shall be kept moist continuously until the curing material is placed. Any damage to the completed Cold In Place Recycled bituminous material shall be repaired by the contractor prior to the placement of the hot mix asphalt concrete surface course, or other applicable surface treatment, and as directed by the Engineer.

Finished Recycled Pavement Layer Smoothness:

The completed cold recycled pavement layer surface shall not vary more than ½ in (12 mm) from the lower edge of a 10-foot (3-meter) straight edge placed on the surface parallel and transversely to the centerline at locations selected by the City. Irregularities exceeding the specified limit shall be corrected at the expense of the contractor by grinding/cold milling or leveling with cold or hot mix asphalt. The corrected areas shall be retested to determine compliance with smoothness.

Quality Control**Contractor Responsibility:**

The contractor shall be responsible for providing field and laboratory quality control testing of materials during construction. The City or its subconsultant may conduct sampling and testing whenever or as often as desired for verification purposes. The contractor shall acquire an adequate amount of material for each sample to be tested in the laboratory so that an ample amount of material is left over in case of the need for resolution testing. Resolution testing will be required and provided at the expense of the contractor if similar laboratory samples tested by the contractor and the City do not coincide within reasonable values as determined by the City. The resolution laboratory will be selected by the City and the testing results provided by this lab will be used for materials acceptance purposes. All materials testing laboratories shall be accredited by the AASHTO Materials Reference Laboratory (AMRL) or Construction Materials

Engineering Council (CMEC). The contractor shall submit all documentation of field inspection and laboratory testing results required herein to the City Engineer prior to payment and upon request. Copies of all delivery tickets and notes regarding any materials brought to the project site shall be given to the City upon delivery to the project site. These tickets shall be signed by an approved representative of the Contractor at the time of delivery.

Crushed RAP Material Sizing:

A sample shall be obtained from the receiving hopper of the paver each ½ mile or as specified by engineer (0.8 km) and screened using a 2 in. (51mm) sieve (or smaller sieve if required) to determine maximum particle size requirement compliance. The resulting gradations shall be compared to the mix design gradations to determine any necessary changes to emulsion content. Gradation results shall be shared with the County by the end of the following day. Sampling procedures shall be in accordance with ASTM D979 or AASHTO T168.

Asphalt Emulsion:

The asphalt emulsion shall be received on the job site within the temperature ranges specified by the emulsion supplier. The emulsion supplier shall provide testing results for each shipment indicating the emulsion is in compliance with the criteria specified in *Table 4*. The City Engineer may require the contractor to obtain emulsion samples from each shipping trailer prior to unloading into the contractor's storage units for quality control testing if desired. The testing shall meet the following requirements:

<i>Table 4 – Emulsion Criteria</i>		
<i>Property</i>	<i>Method</i>	<i>Limit</i>
*Residue from distillation, %	ASTM D244	64.0 to 66.0 %
*Oil distillate by distillation, %	ASTM D244	0.5% maximum
Sieve Test, %	ASTM D244	0.1% maximum
**Residue Penetration, 25°C, dmm	ASTM D5	-25 to +25%
<i>*Modified ASTM D244 procedure – distillation temperature of 177°C with 20 minute hold.</i>		
<i>*To be determined during CIR design phase prior to emulsion formulation and manufacture for project. Penetration value range will be determined and submitted to the County Engineer for approval prior to project start</i>		

Asphalt Emulsion Content and Yield:

Total emulsion quantity and yield shall be monitored and recorded daily and for each segment in which the target emulsion percentage is adjusted. This information shall be gathered from the calibrated emulsion metering device. Emulsion content adjustments shall be made appropriately when multiple and specific mix designs for different road segments of varying composition exist.

Water Content and Yield:

Total water quantity and yield shall be monitored and recorded daily and for each segment in which the target water percentage is adjusted. This information shall be gathered from the water metering device. Water content adjustments shall be made appropriately when multiple and specific mix designs for different road segments of varying composition exist. Water content adjustments shall also be made based on mixture consistency, coating, and dispersion of the recycled materials.

Mixture Testing:

At the discretion of the City Engineer and if the recycled pavement layer quality and workmanship seem suspect, the contractor may be required to sample, in accordance with ASTM D3665 and D979, the recycled mixture for determining compliance with design criteria specified in *Table 1*. If samples of the recycled asphalt pavement mixture are taken after the addition of additives and emulsion, the specimens must be compacted within 15 minutes of sampling and tested as required in *Table 1*. If the recycled mixture is sampled prior to the addition of additives and emulsion, the sample must immediately be transferred to air-tight plastic container to prohibit loss of moisture. Samples must be mixed in the laboratory with the field additives and emulsion within 24 hours and tested as required in *Table 1*.

Depth of Pulverization (Milling):

The depth shall be checked and recorded daily and every 1/8 mile (0.2 km) on both outside vertical faces of the cut. Measure depth by placing a rigid measuring device perpendicular to the bottom of the milled surface and near the vertical faces of the cut.

Compacted Density:

Degree of compaction of the recycled pavement layer shall be monitored for compliance with target wet density established during the initial control strip construction. Wet density shall be determined every 1/4 mile (0.4 km) using a nuclear moisture-density gauge in accordance with ASTM D2950, backscatter measurement mode. Ensure that all nuclear gauges are operated by licensed individuals and have been calibrated within the last 12 months. The acceptable degree of compaction shall be 96 to 98 percent of target wet density. Care shall be taken not to over-roll the mat based on visual observations of check cracking or shoving. A new control strip and target density shall be established if the consistency of the material being recycled changes. The County shall be notified prior to the construction of a new control strip.

Cross-Slope and Smoothness:

The recycled pavement layer cross slope shall be checked regularly during spreading. A minimum 2 % Cross-Slope shall be maintained through the length of the project. The recycled pavement layer shall be checked for smoothness regularly behind the paver and after rolling. The smoothness shall not vary more than 1/2 in (12 mm) from the lower edge of a 10-foot (3-meter) straight edge placed on the surface parallel and transversely to the centerline after rolling is completed. The edge of the mat should be rolled first and progress to the center or high side to prevent excessive edge sloughing.

Table 5 – Quality Control Testing and Inspection Criteria		
Property	Method	Limit
RAP Maximum Particle Size	ASTM C 136 or AASHTO T27	Section 334-2.2
RAP Particle Size Distribution	ASTM C 136 or AASHTO T27	Determined by Mix Design(s)
Emulsion and Water Yield	Calibrated Metering Device	Determined by Mix Design(s)
*Mixture Testing **Depth of Milling	Table 1 Section 334-5.7	Table 1 Determined by Mix Design(s)
Compacted Density	ASTM D2950 AASHTO T-180	96 to 98% of target density
Cross-Slope Smoothness	FM 5-509 FM 5-509	Minimum 2% Maximum 0.5 in (12 mm) deviation from planeness
<i>*Mixture Testing frequency shall be at the County Engineer's discretion</i>		
<i>**Depth of Milling may need to be adjusted for localized unexpected pavement conditions</i>		

Weather Limitations

Cold In-Place recycling operations shall be completed when the atmospheric temperature measured in the shade and away from artificial heat is 50⁰ F (10°C) and rising. Also, the weather shall not be foggy or rainy. The weather forecast shall not call for freezing temperature within 48 hours after placement of any portion of the project.

Documentation

Delivery Tickets - All delivery tickets and notes regarding any materials brought to the project site to complete this item shall be given to the City upon delivery. Tickets shall be signed by an approved representative of the Contractor at the time of delivery.

Method of Measurement:

If a pay item is listed on the Bid Form for work required in this Technical Provision, the quantity to be paid shall be as specified in the Bid Form including all items of work described herein. Any item necessary for Cold-In-Place Recycled Bituminous Paving, and not specifically listed in another item in the Bid Form, shall be included in this item, including but not limited to Maintenance of Traffic.

Basis of Payment:

The quantities to be paid for under this Technical Provision shall be included in the Square Yard price for Cold-In-Place Recycled Bituminous Paving, the per Gallon price for liquid asphalt emulsion, the Cubic Yard price for excavation for widening and the per Ton price for added RAP or Aggregates for mixing, or as listed in the Bid Form. Prices shall be full compensation for the removal and processing of the existing pavement; for preparing, hauling, and placing all materials; for all freight involved; for all manipulations, including rolling and prime and sand for all labor, tools, equipment, quality control testing and incidentals necessary to complete the work. The Unit price includes all items listed in the contract, including all General Conditions, Special Conditions and Technical Provisions pertaining to Cold-In-Place Recycled Bituminous Paving, including all items of work described herein. No additional payment will be provided for any item necessary for the completion of this contract as detailed in the specifications.