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2. Miami-Dade County Department of Transportation and Public Works (DTPW) does not track or monitor downloads of Project documents from this website. Therefore, prospective bidders who choose to use this method of distribution shall also be responsible for monitoring the site and downloading any applicable addenda or supplemental information. DTPW will distribute hard copy addenda or supplemental information only to those persons or firms who we have purchased a hard copy of the original solicitation documents.
3. Miami-Dade County shall not be responsible for errors and omissions occurring in the transmission or downloading of any documents or specifications from this website. In the event of any discrepancy between information obtained from this website and the DTPW hard copy solicitation documents and specifications, the terms of the hard copy documents will prevail.
4. Miami-Dade County does not guarantee continuous, uninterrupted or secure access to this or other related websites. Operation of this website may be affected from time to time by numerous factors outside of our control. In the event that we are notified of any problems in a timely manner we will do our best to assist with those problems that fall within our control. For assistance, contact us at 305-375-2930. Solicitation documents are removed from this website as soon as possible after the due date.
5. DTPW does not accept facsimile or electronic bid responses of any kind. All bids must be submitted in writing, on the forms provided by the County, to the address designated in the bid package. It is the bidder's responsibility to ensure that their submittals are received at the designated location, complete and on time. Bids received after the due date will be rejected, even if the solicitation is still appearing on this site.
6. With regards to Miscellaneous Construction Contracts (MCC) 7040 Plan Request for Price Quotations:
 - a. Only bidders included on the Project's Bidders List, provided by the Internal Service Department, Procurement Management Division to the DTPW, can submit a bid.
 - b. Only timely bids received from bidders included in the Project's Bidders List will be considered.
7. These documents shall not be altered in any manner. Utilization or viewing of these electronic documents shall constitute implicit acknowledgement and acceptance of these provisions. Failure to comply with these provisions may result in rejection of your bid.



RICKENBACKER CAUSEWAY COMFORT STATION NO. 2 SEWER CONNECTION

Miami-Dade County

Supplemental
Solicitation and
Contract Documents

Volume 1

Small Business Enterprise Construction Program (SBE-CONST.):

Not Applicable

Small Business Enterprise SBE-G&S:

1% Goods & Services Goal

Community Workforce Program:

Not Applicable

DTPW Capital Improvements Engineer:

Alicia Arce

RPQ Issue Date:

January 15, 2026

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SECTION 1: INVITATION TO BID

INVITATION TO BID

**Department of Transportation and
Public Works**

**Capital Improvements Division
111 NW 1 St Suite 1410
Miami FL 33128**



**MIAMI-DADE COUNTY, FLORIDA
REQUEST FOR PRICE QUOTATION (RPQ)**

Contract No: MCC 7360 Plan

RPQ No: 20250162

INVITATION TO BID

A RPQ has been issued for the work identified below. If you are interested in submitting a bid for this project, please submit your bid via Sealed Envelopes, attention to Clerk of the Board at 111 NW 1 St Suite 1710 no later than 2/18/2026 at 02:00 PM. If you have any questions, contact Alicia Arce at 305 375 1363.

This RPQ is issued under the terms and conditions of the Miscellaneous Construction Contracts (MCC) Program MCC 7360 Plan.

RPQ DETAILED BREAKDOWN

Bid Due Date:	2/18/2026	Time Due:	02:00 PM	Submitted Via:	Sealed Envelopes		
Estimated Value:	\$1,117,000	(excluding Contingencies and Dedicated Allowances)					
Project Name:	Rickenbacker Causeway Comfort Station No. 2 Sewer Connection						
Project Location:	3095 Rickenbacker Causeway Miami, FL 33149						
License Requirements:	Primary:	General Engineering; Underground Utility / Excavation					
	Sub:	Electrical Contractor; Plumber, Master					
Scope of Work:	(Contractor must obtain and submit all permits prior to performing any work). A. Work under this Contract includes but is not limited to the furnishing of all supervision, labor, materials, tools, equipment and performing all operations required to connect the public sanitary sewer system nearby, with a new sewer pump station, force main extension, to replace a septic system (septic tank and approximately 1,368 square feet of drain field) in accordance with Miami Dade County Public Works Manual and the conditions of the Miami-Dade County Miscellaneous Construction Contract, (MCC) Plan 7360. Work includes but is not limited to: 1. The contractor is responsible to secure all necessary permits including but not limited to submittal of inspections, assessments if required by MDWASD, RER and DOH, shop drawings and permits applications. Contractor will only be reimbursed fees paid to permitting agencies at invoice cost from and dedicated allowance account. All other cost incurred while processing permits are to be added to the Lumps Sum price of the submittal. 2. Remove and proper dispose of existing septic tank, drain field system, including pumping out existing waste and debris. 3. Construct sewer pump station and appurtenances, sewer lateral and sewer force mains in accordance with MDWASD, RER and County Health Department and any other regulatory agency or municipality. 4. Inspect effluent sewer pipe and replace if needed. 5. Harmonize site including replacing and or re-working of revetment rocks, pavers, sod, small plants and or shrubbery to match existing surrounding area. 6. Repair/Replace curbs, sidewalks, pavers, asphalt paths, pavement markings damaged or removed during construction. B. If any changes are required due to conflict of design and or field conditions, the Engineer will make the final determination.						
Document Pickup:	Contact:	Capital Improvements Division	Phone No:	3053751907	Date:	1/15/2026	
	Location:	111 NW 1 Street, Suite 1410					
Pre-Bid Meeting::	YES	Mandatory:	No	Date:	1/29/2026	Time:	10:30 AM
	Location:	3095 Rickenbacker Causeway, Miami FL					
Site Meeting:	YES	Mandatory:	No	Date:	1/29/2026	Time:	10:30 AM
	Location:	3095 Rickenbacker Causeway, Miami FL					
Bid shall be submitted to:	Contact:	Clerck of the Board					
	Address:	111 NW 1 St Suite 1710					
	Email:	clerckbcc@miamidade.gov			FAX # :		
Type of Contract:	Single Trade			Method of Award:	Lowest Responsible Bidder		
Method of Payment:	Scheduled Monthly Payments			Insurance Required:	YES		
Additional Insurance Required:	YES			If Yes - Minimum Coverage:	\$1,000,000.00		

Performance & Payment Bond Required:		YES		Bid Bond Required:		YES	
Davis Bacon:	NO	Maintenance Wages:	NO	AIPP:	NO	Amount:	
DBE Participation:	NO	Percentage:	0.00%	DBE Subcontractor Forms Required:		NO	
SBE-S Requirements	NO	Percentage:	0.00%				
SBE-Services Commodity Set-Aside	NO	If Yes, Service =					
SBE-G Requirements	YES	Percentage:	1.00%				
SBE-Goods Commodity Set-Aside	NO	If Yes, Goods =					
Liquidated Damages:	YES	\$\$ Per Day:	\$1,685.00				
For RPP's less than \$10,000, if no LD rate is specified, the County reserves the right to assess actual damages in lieu of LDs.							
Design Drawing Included:	YES	Shop Drawing Included:	NO	Specifications Included:		YES	
Anticipated Start Date:	5/18/2026			Calendar Days for Project Completion:		365	
Comments:	Pursuant to Section 2-8.10 of the Code of Miami-Dade County, this Contract is subject to a user access fee under the County's User Access Program (UAP) in the amount of two percent (2%). All construction services provided under this contract are subject to the 2% UAP. This fee applies to all Contract usage whether by County Departments or by any other governmental, quasi-governmental or not-for-profit entity. From every payment made to the Contractor under this contract (including the payment of retainage), the County will deduct the two percent (2%) UAP fee provided in the ordinance and the Contractor will accept such reduced amount as full compensation for any and all deliverables under the contract. The County shall retain the 2% UAP for use by the County to help defray the cost of its procurement program. Contractor participation in this pay request reduction portion of the UAP is mandatory. Provided, however, UAP shall not be applicable for total contract values, inclusive of contingency and allowance accounts, of less than five hundred thousand dollars (\$500,000.00). On May 28, 2024, the Governor signed into law House Bill ("HB") 705. Prior to the adoption of HB 705, section 255.0992 of the Florida Statutes generally prohibited Miami-Dade County (the "County"), from requiring a contractor, subcontractor, or supplier to pay or provide a predetermined amount of wages or benefits to its employees or recruit or hire employees from a designated or restricted source in construction projects paid for with any state-appropriated funds. Additionally, under the same statute, the County could not apply small business measures or limit bidding among Small Business Enterprise-Construction ("SBE-Con") firms for construction projects paid for with any state funds. However, for contracts funded solely with County funds, prior to the adoption of HB 705, section 255.0992 did not limit the application of the County's SBE-Con program, responsible wages, or workforce requirements. HB 705 revised the definition of the term "public works project" in Section 255.0992, Florida Statutes to include activities paid for with local County funds, making the various prohibitions found in section 255.0992 applicable to County funded construction contracts. HB 705 impacts construction projects that are in various phases of the procurement process whether pending advertisement or bid submittal, and in some cases pending contract award with bids having been received. Thus, considering the passing of HB 705, effective July 1, 2024, the following prohibitions exist: • The County's Responsible Wages & Benefits, Community Workforce, Residence First Training and Employment, and Employ Miami-Dade Program requirements will not be applied to the County's capital construction projects, including design-build projects, awarded after July 1, 2024. • The County's SBE-Con requirements cannot be applied on any capital construction projects, including design-build projects, if initial bids or proposals are received on or after July 1, 2024. A 1.0 % SBE-G&S goal in the following recommended services/commodities: • NIGP 98852: Landscaping Services • NIGP 90974: Site Clean-up The bidder is free to utilize any other applicable commodities/services that are not license based construction trades found on the project to meet the SBE – Goods & Services Goal." LICENSE REQUIREMENTS: At the time of Bid and pursuant to the requirements of Section 10-3 of the Code of Miami-Dade County Florida and these Solicitation and Contract Documents, the Bidder must hold a valid, current, and active:						

Certificate of Competency from the County's Construction Trades Qualifying Board as a Specialty Engineering Contractor, commensurate to the requirements of the Scope of Work, in one or more engineering crafts to include, General Engineering Contractor, General Contractor, Underground Utility/ Excavation Contractor. The specialty contractor shall subcontract with a qualified contractor any work which is incidental to the specialty but is specified in the aforementioned Code as being the work of other than that of the Engineering Specialty for which certified as licensed plumber and electrical contractor.

EXPERIENCE:

The Bidder must demonstrate that it has full-time personnel with the necessary experience to perform the Project's Scope of Work. This experience shall include work in successfully completed projects performed by the identified personnel whose bulk of work performed in the Public Right-of-Way is similar in detail to the Project's Scope of Work described in these Solicitation Documents. Demonstrate the experience requirement by:

Providing a detailed description of at least three (3) projects similar in detail to the Project's Scope of Work described in these Solicitation Documents and in which the Bidder's identified personnel is currently engaged or has completed within the past five years. List and describe the aforementioned projects and state whether the work was performed for the County, other government clients, or private entities. The description must identify for each project:

- 1) The identified personnel and their assigned role and responsibilities for the listed project
- 2) The client's name and address including a contact person and phone number for reference
- 3) Description of work
- 4) Total dollar value of the contract
- 5) Contract duration
- 6) Statement or notation of whether Bidder's referenced personnel is/was employed by the prime contractor or subcontractor, and
- 7) For completed projects, provide letters of certification of final acceptance or similar project closure documentation issued by the client and available Contractor's performance evaluations.

2. The County reserves the right to request additional information and/or contact listed persons pertaining to bidder's experience.

INDEMNIFICATION AND INSURANCE REQUIREMENTS

The Contractor shall furnish to Department of Transportation and Public Works, 111 NW 1 Street, Miami Florida 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

A. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.

B. Commercial General Liability Insurance in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate, not to exclude Products and Completed Operations and Explosion Collapse and Underground Hazards. Miami-Dade County must be shown as an additional insured with respect to this coverage.

C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.

D. Pollution Liability Insurance in an amount not less than \$1,000,000 per occurrence covering third party claims, remediation expenses, and legal defense expenses arising from on-site and off-site loss, or expense or claim related to the release or threatened release of Hazardous Materials that result in contamination or degradation of the environment and surrounding ecosystems, and/or cause injury to humans and their economic interest.

E. Umbrella Liability Insurance in an amount not less than \$3,000,000 per occurrence, and \$3,000,000 in the aggregate.

• If Excess Liability is provided must be follow form for coverages B and C.

F. Completed Value Builders' Risk Insurance on an "all risk" basis in an amount not less than one hundred (100%) percent of the completed contract value. The policy shall be in the name of Miami Dade County and the Contractor.

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

BID DOCUMENTS:

Bidding documents may be obtained from the Miami-Dade County Department of Transportation and Public Works, Capital Improvements Division, located at 111 NW 1st Street, 14th Floor, Miami, Florida 33128, for a non-refundable fee of fifteen dollars (\$15.00) per USB drive. Payment must be made by company check, cashier's check, or money order payable to "Miami-Dade County, Department of Transportation and Public Works."

Alternatively, bidding documents are available for free download at:

<https://www.miamidade.gov/apps/isd/StratProc/Home/CurrentSolicitations>

ADDENDUMS - RFIs

All RFI requests should be e-mailed to Alicia.Arce@miamidade.gov while copying the Clerk of the Board (clerkbcc@miamidade.gov).

The Department of Transportation and Public Works has made changes with regard to how addendums and requests for information (RFI) will be sent to document holders. Be advised that all Addendums, RFI's, and the document holders list (bidder's list) are now available to view online at the following web address:

<https://www.miamidade.gov/apps/isd/StratProc/Home/CurrentSolicitations>

All document holders must provide a dedicated e-mail address. The Department will only be sending addendums and RFI's by e-mail and posting online at the aforementioned link. The bidders list will be updated every Friday during the advertisement phase of the contract. Please be aware that acknowledgment of receipt of all addendums and RFI's remain a requirement when submitting bids.

Vendor Registration:

Due to the new Vendor Registration procedures of the Internal Services Department, Procurement Management Division, updated definitions along with the "Affirmation of Vendor Affidavits" has been added to the Bid Submittal Package. The successful bidder must be registered under this new procedure prior to award.

PRE BID - BID SUBMITTAL DUE DATE:

Pre-Bid Conference date, time and location: Thursday, January 29, 2026, at 10:30 A.M. The Department of Transportation and Public Works (DTPW) has scheduled a non-mandatory Site Visit Meeting. The Site Visit Meeting will be held on Thursday January 29, 2026, at the following location: 3095 Rickenbacker Causeway Miami, FL 33149

The bidder must arrive on time for the Site Visit Meeting and Pre-Bid meeting; there is no guarantee that the meeting will be repeated.

Bid Submittal Time and Location: Wednesday, 2:00 P.M., February 18, 2026, at 111 NW 1 Street, 17th Floor, Clerk of the Board Office.

Deadline to received questions (RFI) will be February 10, 2026.

Bid Opening immediately after Bid Submittal on the 18th floor.

PRA section recommends a 1.0 % SBE-G&S goal in the following recommended services/commodities:

- NIGP 98852: Landscaping Services
- NIGP 90974: Site Clean-up

DISCLOSURE:

- Contractor shall indemnify and hold harmless the County and its officers, employees, agents and instrumentalities from any and all liability, losses or damages, including attorneys' fees and costs of defense, which the County or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature arising out of, relating to or resulting from the performance of this Agreement by the Contractor or its employees, agents, servants, partners principals or subcontractors. Contractor shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind or nature in the name of the County, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. Contractor expressly understands and agrees that any insurance protection required by this Agreement or otherwise provided by the Contractor shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County or its officers, employees, agents and instrumentalities as herein provided.

The Contractor shall furnish to **Department of Transportation and Public Works, Capital Improvements Division, 111 NW 1 St Suite 1410, Miami FL 33128**, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

- A.** Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.
 - a. If applicable should include coverage required under the U.S. Longshoremen and Harbor Workers' Act (USL&H) and/or Jones Act for any activities on or about navigable water.
- B.** Commercial General Liability in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate. Miami-Dade County must be shown as an additional insured with respect to this coverage.
- C.** Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.

*Under no circumstances are Contractors permitted on the Aviation Department, Aircraft Operating Airside (A.O.A) at Miami International Airport without increasing automobile coverage to \$5 million. Only vehicles owned or leased by a company will be authorized. \$1 million limit applies at all other airports.

VERIFICATION OF EMPLOYMENT ELIGIBILITY (E-VERIFY):

By entering the Contract, the Awarded Bidder becomes obligated to comply with the provisions of Section 448.095, Florida Statute, titled "Verification of Employment Eligibility." This includes but is not limited to utilization of the U.S. Department of Homeland Security's E-Verify System to verify the employment eligibility of all newly hired employees by the Awarded Bidder effective, January 1, 2021, and requiring all Subcontractors to provide an affidavit attesting that the Subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply may lead to termination of this Awarded Bidder, or if a Subcontractor knowingly violates the statute, the subcontract must be terminated immediately. Any challenge to termination under this provision must be filed in the Circuit Court no later than twenty (20) calendar days after the date of termination. If this Contract is terminated for a violation of the statute by the Awarded Bidder, the Awarded Bidder may not be awarded a public contract for a period of one year after the date of termination, and the Awarded Bidder may be liable for any additional costs incurred by the County resulting from the termination of the Contract. Public and private employers must enroll in the E-Verify System (<http://www.uscis.gov/e-verify>) and retain the I-9 Forms for inspection.

SECTION 2: SOLICITATION FORMS

All forms and documents contained in this Section shall be completed pursuant to these Contract Documents and submitted with the Bid Submittal for this Project.

BID FORM

Bid Form

PROJECT TITLE: Rickenbacker Causeway Comfort Station No. 2 - Sewer Connection

PROJECT NO: 20250162

IF THIS PROPOSAL IS ACCEPTED, THE UNDERSIGNED AGREES TO COMPLETE ALL WORK UNDER THIS CONTRACT WITHIN THREE HUNDRED SIXTY FIVE (365) CALENDAR DAYS AFTER THE EFFECTIVE DATE ESTABLISHED IN THE *NOTICE TO PROCEED WITH CONTRACT WORK*.

Item No	Quantity	Unit	Description	Written Unit Amount	Unit Price	Total
1WSR	2,250.0	S.F.	Saw cut and remove an average of two (2) inches of temporary cold asphalt patch on trench in order to expose and evaluate the condition of the base. If base is found suitable, clean loose material and replace the amount of cold patch removed with hot type S asphaltic concrete up to the level of the surrounding surface.			
2WSR2	2,250.0	S.F.	Saw cut and remove an average of two (2) inches of existing temporary cold asphalt patch on trench in order to expose and evaluate the condition of the base. If base is found unsuitable by the Engineer, remove base material and replace with a minimum of eight (8) inches of compacted limerock or six (6) inches of hot S asphaltic concrete. In either case, replace the cold patch removed with hot type Superpave Asphaltic Concrete S.P. 9.5 up to the level of the surrounding surface.			
102-1A-1	1.0	L.S.	MAINTENANCE OF TRAFFIC			
104-20	1.0	L.S.	Abandon Existing Septic Tank System			
422-2-6	80.0	S.Y.	6" Concrete Pavement. (Includes Reinforcement Steel)			
425-2-6	50.0	L.F.	CONCRETE CURB TYPE "D"			
430-18-4 includes all fitting, elbows, bends and appurtenances						
430-18-4	1,500.0	L.F.	Install 4-inch pipe HDPE via Horizontal Direction Drill			
446-18-4	200.0	L.F.	Install 4-inch DIP piping outside of HDD pit areas			
448-73-2G For selling, delivering and complete installation of MOPS pump station package to include wet well, valve vault, water tight hatches, electrical and control system, pumps, connection of water service to the existing comfort station water service, installation of lockable hose bib, installation of 8-inch ductile iron gravity main into pump station wet well. Line item includes installation of sheet piles required for wet well installation. Line item also, includes startup testing and 1-year						
448-73-2G	1.0	L.S.	Pump Station			
514-71-1A	1.0	L.S.	Temporary Erosion Control LS			

CSCCRP_PROJECT_BID_ITEMS

01/08/2026 04:30 PM

Bidder must fill-in completely the next page for the bid to be valid.

Page 1 of 3

Bid Form

PROJECT TITLE: Rickenbacker Causeway Comfort Station No. 2 - Sewer Connection

PROJECT NO: 20250162

IF THIS PROPOSAL IS ACCEPTED, THE UNDERSIGNED AGREES TO COMPLETE ALL WORK UNDER THIS CONTRACT WITHIN THREE HUNDRED SIXTY FIVE (365) CALENDAR DAYS AFTER THE EFFECTIVE DATE ESTABLISHED IN THE *NOTICE TO PROCEED WITH CONTRACT WORK*.

Item No	Quantity	Unit	Description	Written Unit Amount	Unit Price	Total
526-1-2H	12.0	S.Y.	CONCRETE PAVERS			
580-01 including landscaping, pavement and pit areas						
580-01	1.0	L.S.	LANDSCAPE (Includes tree planting and relocation, metal tree grates, hedge shrubs, ground covers, mulch, planting soil, landscape stone, rice rock, weed guards, vines grading, etc.)			
ws-1050-11-0400 includes all cost of making tapping connection						
WS-1050-11-0400	1.0	EA	Furnish & Install 4" x 8" Tapping Sleeve and Valve			

Total: _____

The bidder understands and agrees that the above total is inclusive of all work necessary to complete the job as described in the plans and specifications.

Quantities are established and are included only for the purpose of facilitating the uniform comparison of bids submitted. The County shall not be held responsible if the quantities are not accurate and all computations for compensation shall be based upon the actual work performed, whether greater or less than estimated quantities.

Tax Identification Number: _____

D.C. Certificate of competency No: _____

Bidder's Name: _____

Bidder's telephone Number: _____

Bidder's address: _____

Bid Form

PROJECT TITLE: Rickenbacker Causeway Comfort Station No. 2 - Sewer Connection

PROJECT NO: 20250162

IF THIS PROPOSAL IS ACCEPTED, THE UNDERSIGNED AGREES TO COMPLETE ALL WORK UNDER THIS CONTRACT WITHIN THREE HUNDRED SIXTY FIVE (365) CALENDAR DAYS AFTER THE EFFECTIVE DATE ESTABLISHED IN THE *NOTICE TO PROCEED WITH CONTRACT WORK*.

BIDDER ACKNOWLEDGES THAT INCLUDED IN THE VARIOUS ITEMS OF THE PROPOSAL AND IN THE TOTAL BID PRICE ARE COSTS FOR COMPLYING WITH THE FLORIDA TRENCH SAFETY ACT (90-96), LAWS OF FLA. EFFECTIVE OCTOBER 1st, 1990. THE BIDDER FURTHER IDENTIFIES THE COSTS TO BE SUMMARIZED BELOW:

	Trench Safety Measure (Description)	Units of Measure (LF, SY)	Unit (Quantity)	Unit Cost	Extended Cost
A.					
B.					
C.					
D.					

FAILURE TO COMPLETE THE ABOVE MAY RESULT IN THE BID BEING DECLARED NON-RESPONSIVE

ATTACHMENT 5A

Department of
Transportation and Public
Works
Capital Improvements Division
111 NW 1 St Suite 1410
Miami, FL 33128



MIAMI-DADE COUNTY, FLORIDA
REQUEST FOR PRICE QUOTATION (RPQ)
Contract No: MCC 7360 Plan
RPQ No: 20250162

RPQ BID FORM – ATTACHMENT 5A

RPQ Project Name: Rickenbacker Causeway Comfort Station No. 2 Sewer Connection

Price Proposal (Cost to Perform the work **must** be stated here. State 'No Bid' if not submitting a price proposal)

Bidder's Company Name: _____

Company Address: _____

City: _____ **State:** _____ **Zip:** _____

Telephone No: _____ **Fax No:** _____ **Email:** _____

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF PROPOSER TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BELOW BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE PROPOSAL NON-RESPONSIVE. THE COUNTY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE PROPOSER TO THE TERMS OF ITS OFFER.

Name of Person Submitting Quote (Print): _____

Number of Addendums received: _____ (if none' write "None")

Signature: _____ **Date:** _____

Note: Quotes must be submitted on this form. Quote envelope must state RPQ Number, date and time due and the Bidder's Name. Use of any other form for submission of the price quotation shall result in the rejection of the price quotation. Late bids will not be opened. *Low bidder will be notified, in the Recommendation of Award, of the requirements to submit current copies of insurance certificates in accordance with the Contract Documents. By signature, the CONTRACTOR agrees to be bound by the terms set forth in the MCC 7360 Plan.*

ACKNOWLEDGEMENT OF ADDENDA

MIAMI-DADE COUNTY
Department of Transportation and Public Works (DTPW)

PROJECT: Rickenbacker Causeway Comfort Station No 2 Sewer Connection
Project No. 20250162

ACKNOWLEDGEMENT OF ADDENDA

(Must be completed and submitted with required solicitation documents)

Instructions: Complete Part I or Part II, as applicable.

PART I: Listed below are the dates of issue for each Addendum received in connection with this solicitation.

Addendum #1, Dated _____, 202__

Addendum #2, Dated _____, 202__

Addendum #3, Dated _____, 202__

Addendum #4, Dated _____, 202__

Addendum #5, Dated _____, 202__

Addendum #6, Dated _____, 202__

Addendum #7, Dated _____, 202__

Addendum #8, Dated _____, 202__

Addendum #9, Dated _____, 202__

Addendum #10, Dated _____, 202__

PART II:

_____ No Addendum was received in connection with this solicitation.

Authorized Signature: _____ Date: _____

Print Name: _____ Title: _____

Firm Name: _____

SURETY BID BOND FORM

SURETY BID BOND		DATE BOND EXECUTED (must not be later than bid opening date)		REV. 0216 DTPW	
PRINCIPAL (Full legal name and business address)			TYPE OF ORGANIZATION ("X" one)		
			☐ Individual	☐ Partnership	
			☐ Joint Venture	☐ Corporation	
SURETY (Name and business address)					

PENAL SUM OF BOND		*****Five Percent of the Total amount Bid*****			
BID IDENTIFICATION	Project No:	20250162		Bid Opening Date:	
	County Project Name:	Rickenbacker Causeway Comfort Station No 2 Sewer Connection			

OBLIGATION

Principal and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Miami-Dade County, Florida (herein after County) upon default of Principal the penal sum set forth on the face of this Bond.

Principal and Surety agree that the Penal Sum of the Bond is a liquidated damage reasonably estimated to compensate the County for damages suffered as a result of the Principal's default including but not limited to any resulting from delay, reprourement costs and incremental costs of contracting.

Default of Principal shall occur in the event that the Principal withdraws Bid within 180 days after bid opening (or any extension thereof agreed to in writing by the Bidder and County); or, after proper notification of intent to Contract from the County, fails to comply with all pre-award requirements including, but not limited to providing Payment and Performance Bonds with good and sufficient surety and the necessary Insurance Certificates pursuant to the Contract Documents, and enter into a written Contract with the County, as may be required; all within 10 days after the prescribed forms are presented to Principal for signature or as otherwise required by the Bidding Documents.

Payment under this Bond will be due and payable upon default of Principal and within 30 calendar days after receipt by Principal and Surety of written notice of default from County, which notice will be given with reasonable promptness, identifying this Bond and the Project.

Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

CONDITIONS

The Principal has submitted the Bid identified above.

THEREFORE

By executing this instrument Surety agrees that its obligation is not impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to the County. Notice to the Surety of extensions is waived. However, waiver of the notice applies only to extensions aggregating not more than 60 calendar days in addition to the period originally allowed for acceptance of the bid. Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this Bond.

WITNESS

The Principal and Surety executed this Bond and affixed their seals on the above date. Copy of Authorized Agent's current Identification Card as issued by State of Florida Insurance Commissioner must be attached.

PRINCIPAL		
SIGNATURE		Principal's Corporate Seal
NAME AND TITLE (Typed)		
SURETY		
SIGNATURE OF ATTORNEY-IN-FACT		Surety's Corporate Seal
PRINTED NAME OF ATTORNEY-IN-FACT (Typed)		
SIGNATURE OF AUTHORIZED FLORIDA AGENT		
PRINTED NAME OF AUTHORIZED FLORIDA AGENT (Typed)		

NON-COLLUSION AFFIDAVIT



NON-COLLUSION AFFIDAVIT

(In accordance with [Sections 2-8.1.1](#) and [10-33.02.1](#) of the Code of Miami-Dade County)

I, the undersigned, am over 18 years of age, have personal knowledge of the facts stated in the Non-Collusion Affidavit (*this Affidavit*) and I am an owner, officer, director, principal shareholder and/or otherwise authorized to bind the Bidder/Proposer of this solicitation.

- A. I have reviewed the list of respondents attached to this Affidavit. I state that the Bidder/Proposer of this competitive solicitation (check one):

☐ is **not related** to any of the other respondents submitting a Bid/Proposal in the competitive solicitation.

☐ is **related** to the following respondents who submitted a Bid/Proposal in the competitive solicitation, which are identified and listed below:

- B. I state that the Bidder/Proposer of this competitive solicitation:

1. has prepared this Bid/Proposal independently without consultation, communication, agreement or arrangement with any other Bidder/Proposer or competitor for the purpose of restricting competition;
2. has submitted the Bid/Proposal in its own behalf, and not in the interest or on behalf of any person not therein named;
3. has not, directly or indirectly, induced or solicited any other Bidder/Proposer to put in a sham proposal, or any other person, firm, or corporation to refrain from proposing;
4. has not in any manner sought by collusion to secure an advantage over any other Bidder/Proposer.

Note: Any person or entity that fails to submit this executed Affidavit shall be ineligible for contract award. In accordance with Section 2-8.1.1 of the Code of Miami-Dade County, where two or more related parties, as defined herein, each submit a Bid for any contract, such Bids shall be presumed to be collusive. The foregoing presumption may be rebutted by the presentation of evidence as to the extent of ownership, control and management of such related parties in preparation and submittal of such Bids. **Related parties** shall mean the Bidder/Proposer; the principals, corporate officers, and managers of a Bidder/Proposer; or the spouse, domestic partner, parents, stepparents, siblings, children or stepchildren of a Bidder/Proposer or the principals, corporate officers and managers thereof which have a direct or indirect ownership interest in another Bidder/Proposer for the same contract or in which a parent company or the principals thereof of one Bidder/Proposer have a direct or indirect ownership interest in another Bidder/Proposer for the same contract. Bid/Proposal found to be collusive shall be rejected. Bidder/Proposer who has been found to have engaged in collusion may be considered non-responsible, and may be suspended or debarred, and any contract resulting from collusive bidding may be terminated for default.

Written Declaration: Pursuant to §92.525, Florida Statutes, under penalties of perjury, I declare that I have read the foregoing Affidavit and that the facts stated in it are true, accurate, and complete.

Solicitation No.: _____ Solicitation Title: _____

By: _____ Date: _____ 20 ____
Signature of Affiant

Printed Name of Affiant and Title

Federal Employer Identification Number

Printed Name of Bidder/Proposer

Address of Bidder/Proposer

AFFIRMATION OF VENDOR AFFIDAVITS



New Vendor Registration and Bid/Proposal Contract Language

1.1. DEFINITIONS FOR VENDOR REGISTRATION

Bid – shall refer to any offer(s) submitted in response to this solicitation.

Bidder – shall refer to anyone submitting a Bid in response to this solicitation.

Bid Solicitation – shall mean this solicitation documentation, including any and all addenda.

Bid Submittal Form – defines the requirement of items to be purchased, and must be completed and submitted with Bid. The Bidder should indicate its name in the appropriate space on each page.

County – shall refer to Miami-Dade County, Florida

DPM – shall refer to Miami-Dade County's Department of Procurement Management.

Enrolled Vendor – shall refer to a firm that has completed the necessary documentation in order to receive Bid notifications from the County.

Registered Vendor – shall refer to a firm that has completed the Miami-Dade County Business Entity Registration Application and has satisfied all requirements to enter into business agreements with the County.

The Vendor Registration Package – shall refer to the Business Entity Registration Application.

For additional information about on-line vendor enrollment or vendor registration contact the Vendor Assistance Unit at 111 N.W. 1st Street, 13th Floor, Miami, FL 33128, Phone 305-375-5773. Vendors can enroll online and obtain forms to register by visiting our web site at www.miamidade.gov/dpm

1.2. INSTRUCTIONS TO BIDDERS

A. Bidder Qualification

It is the policy of the County to encourage full and open competition among all available qualified vendors. All vendors regularly engaged in the type of work specified in the Bid Solicitation are encouraged to submit Bids. Vendors may enroll with the County to be included on a notification list for selected categories of goods and services. To be eligible for award of a contract (including small purchase orders), Bidders must become a Registered Vendor. Only Registered Vendors can be awarded County contracts. Vendors are required to register with the County by contacting the Vendor Assistance Unit. The County endeavors to obtain the participation of all qualified small business enterprises. For information and to apply for certification, contact the Department of Small Business Development at 111 N.W. 1st Street, 19th Floor, Miami, FL 33128-1900, or telephone at 305-375-3111. County employees and board members wishing to do business with the County are referred to Section 2-11.1 of the Miami-Dade County Code relating to Conflict of Interest and Code of Ethics.

B. Vendor Registration

To be recommended for award the County requires that vendors complete a Miami-Dade County Vendor Registration Package. Effective June 1, 2008, a new Vendor Registration Package, including a Uniform Affidavit Packet (Affidavit form), must be completed by vendors and returned to the Department of Procurement Management (DPM), Vendor Assistance Unit, within fourteen (14) days of notification of the intent to recommend for award. In the event the Vendor Registration Package is not properly completed and returned within the specified time, the County may in its sole discretion, award to the next lowest responsive, responsible Bidder. The Bidder is responsible for obtaining the Vendor Registration Package, including all affidavits by downloading from the DPM website at www.miamidade.gov or from the Vendor Assistance Unit at 111 N.W. 1st Street, 13th Floor, Miami, FL 33128.

Bidders are required to affirm that all information submitted with the Vendor Registration Package is current, complete and accurate, at the time they submit a response to a Bid Solicitation, by completing the provided Affirmation of Vendor Affidavit form.

In becoming a Registered Vendor with Miami-Dade County, the vendor confirms its knowledge of and commitment to comply with the following:

1. **Miami-Dade County Ownership Disclosure Affidavit**
(Sec. 2-8.1 of the County Code)
2. **Miami-Dade County Employment Disclosure Affidavit**
(County Ordinance No. 90-133, amending Section 2-8.1(d)(2) of the County Code)
3. **Miami-Dade County Employment Drug-free Workplace Certification**
(Section 2-8.1.2(b) of the County Code)
4. **Miami-Dade Disability and Nondiscrimination Affidavit**
(Article 1, Section 2-8.1.5 Resolution R182-00 Amending R-385-95)
5. **Miami-Dade County Debarment Disclosure Affidavit**
(Section 10.38 of the County Code)
6. **Miami-Dade County Vendor Obligation to County Affidavit**
(Section 2-8.1 of the County Code)
7. **Miami-Dade County Code of Business Ethics Affidavit**
(Article 1, Section 2-8.1(i) and 2-11(b)(1) of the County Code through (6) and (9) of the County Code and County Ordinance No 00-1 amending Section 2-11.1(c) of the County Code)
8. **Miami-Dade County Family Leave Affidavit**
(Article V of Chapter 11 of the County Code)

9. **Miami-Dade County Living Wage Affidavit**
(Section 2-8.9 of the County Code)

10. **Miami-Dade County Domestic Leave and Reporting Affidavit**
(Article 8, Section 11A-60 11A-67 of the County Code)

11. **Subcontracting Practices**
(Ordinance 97-35)

12. **Subcontractor /Supplier Listing**
(Ordinance 97-104)

13. **Environmentally Acceptable Packaging**
Resolution (R-738-92)

14. **W-9 and 8109 Forms**
The vendor must furnish these forms as required by the Internal Revenue Service.

15. **Social Security Number**
In order to establish a file for your firm, you must provide your firm's Federal Employer Identification Number (FEIN). If no FEIN exists, the Social Security Number of the owner or individual must be provided. This number becomes your "County Vendor Number". To comply with Section 119.071(5) of the Florida Statutes relating to the collection of an individual's Social Security Number, be aware that DPM requests the Social Security Number for the following purposes:

- Identification of individual account records
- To make payments to individual/vendor for goods and services provided to Miami-Dade County
- Tax reporting purposes
- To provide a unique identifier in the vendor database that may be used for searching and sorting departmental records

16. **Office of the Inspector General**
Pursuant to Section 2-1076 of the County Code.

17. **Small Business Enterprises**
The County endeavors to obtain the participation of all small business enterprises pursuant to Sections 2-8.2, 2-8.2.3 and 2-8.2.4 of the County Code and Title 49 of the Code of Federal Regulations.

18. **Antitrust Laws**
By acceptance of any contract, the vendor agrees to comply with all antitrust laws of the United States and the State of Florida.

C. PUBLIC ENTITY CRIMES

To be eligible for award of a contract, firms wishing to do business with the County must comply with the following:

Pursuant to Section 287.133(2)(a) of the Florida Statutes, a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 of the Florida Statutes, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.



Contract No. : _____ Federal Employer Identification Number (FEIN): _____

Contract Title: _____

1.	Miami-Dade County Ownership Disclosure Sec. 2-8.1 of the County Code	6.	Miami-Dade County Vendor Obligation to County Section 2-8.1 of the County Code
2.	Miami-Dade County Employment Disclosure County Ordinance No. 90-133, amending Section 2-8-1(d)(2) of the County Code	7.	Miami-Dade County Code of Business Ethics Article 1, Section 2-8.1(i) and 2-11(b)(1) of the County Code through (6) and (9) of the County Code and County Ordinance No 00-1 amending Section 2-11.1(c) of the County Code
3.	Miami-Dade County Employment Drug-free Workplace Certification Section 2-8.1.2(b) f the County Code	8.	Miami-Dade County Family Leave Article V of Chapter 11, Resolution No. R-183-00 amending Resolution No. R – 1499-91 of the County Code
4.	Miami-Dade County Disability Non-Discrimination Article 1, Section 2-8.1.5 Resolution R182-00 amending R-385-95	9.	Miami-Dade County Living Wage Section 2-8.9 of the County Code
5.	Miami-Dade County Debarment Disclosure Section 10.38 of the County Code	10.	Miami-Dade County Domestic Leave and Reporting Article 8, Section 11A-60 11A-67 of the County Code

5/09/2008

CONTRACTOR DUE DILIGENCE AFFIDAVIT

Miami-Dade County

Contractor Due Diligence Affidavit

Per Miami-Dade County Board of County Commissioners (Board) Resolution No. R-63-14, County Vendors and Contractors shall disclose the following as a condition of award for any contract that exceeds one million dollars (\$1,000,000) or that otherwise must be presented to the Board for approval:

- (1) Provide a list of all lawsuits in the five (5) years prior to bid or proposal submittal that have been filed against the firm, its directors, partners, principals and/or board members based on a breach of contract by the firm; include the case name, number and disposition;
- (2) Provide a list of any instances in the five (5) years prior to bid or proposal submittal where the firm has defaulted; include a brief description of the circumstances;
- (3) Provide a list of any instances in the five (5) years prior to bid or proposal submittal where the firm has been debarred or received a formal notice of non-compliance or non-performance, such as a notice to cure or a suspension from participating or bidding for contracts, whether related to Miami-Dade County or not.

All of the above information shall be attached to the executed affidavit and submitted to the Procurement Contracting Officer (PCO)/ AE Selection Coordinator overseeing this solicitation. The Vendor/Contractor attests to providing all of the above information, if applicable, to the PCO.

Contract No. : _____ Federal Employer
Identification Number (FEIN): _____

Contract Title: _____

Printed Name of Affiant

Printed Title of Affiant

Signature of Affiant

Name of Firm

Date

Address of Firm

State

Zip Code

Notary Public Information

Notary Public - State of _____ County of _____

Subscribed and sworn to (or affirmed) before me this _____ day of, _____ 20

by _____ He or she is personally known to me ☐ or has produced identification

Type of identification produced _____

Signature of Notary Public

Serial Number

Print or Stamp of Notary Public

Expiration Date

Notary Public Seal

SECTION 3: INSTRUCTIONS TO BIDDERS

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

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1. SUPPLEMENTAL BIDDING REQUIREMENTS

1.01 BID FORMS

A. Estimated Quantities.

1. The Bid Form contains estimated quantities that are provided for bidding purposes only. The actual quantities required to construct the Work may vary from those shown. The County reserves the right to increase, or decrease the quantities, or to delete any of the items for which there is no need throughout the length of the Contract.
2. Bid Items which are estimated with a unit quantity of one are anticipated to be use in minimal quantities, if any, as approved by the Engineer. Any Contract provisions pertaining to adjustments in item prices shall not apply. Therefore, no adjustment shall be made to the unit prices awarded as a result of changes to the estimated quantities provided in the Bid Form. Final quantities shall be as approved by the Engineer.

B. Preparation of Proposal.

1. All blank spaces on the Bid Form for bid prices must be filled in ink, in both words and figures. In the event of any discrepancy in the entries for the price of any item, the unit price as shown in words shall govern unless both the extension and the unit prices shown in figures are in agreement with each other, in which case they shall govern over the unit price shown in words.
2. If the Bid is made by an individual, a sole proprietorship or an individual operating under a trade name, the name and post office address of the individual or owner must be shown in each instance. If made by a partnership, the Bid must be signed by one of the partners, and the names and addresses of the partners must be listed. If made by a corporation, the Bid must be signed by an authorized officer or agent of the corporation, the corporation must be clearly identified and the corporate seal must be affixed. In addition, a Bid made by a corporation must also list the name of the state wherein the corporation was chartered and the business address of the corporation.
3. Bids must be submitted only on the hardcopy Bid form provided with these Contract Documents unless a revised Bid Form is provided by the County via Addendum, in which case the latest Bid Form provided by Addendum shall be used.
4. All required forms must be completed and submitted and, all blanks must be filled in.

C. Rejection of Irregular Proposals.

1. Bids will be considered irregular, and may be rejected, if they show omissions, alterations of form, additions not called for, conditions or unauthorized alternate bids, or irregularities of any kind; or if the unit prices are obviously unbalanced either in excess of or below a reasonable cost analysis value.

D. Pay Items.

1. Any work not specifically mentioned in the pay items listed in the Proposal, but indicated on the plans and/or specifications, shall be considered as incidental to one or more of the pay items, and no claim for additional compensation will be allowed, and it shall be assumed that the cost therefore is included in the prices for the various items in the Contract.

1.02 BID SECURITY

- A. Simultaneously with the delivery of the Bid to the County, on or before the bid due date, the Bidder must deliver to the County a bid security in the form of a Bid Bond on the form provided in the Bidding Documents or in Cash, in the form of a Certified Check, Cashier's Check or Irrevocable Letter of Credit made payable to the Department, for an amount equal to no less than five percent of the Total amount Bid. Failure to furnish a bid security in the proper form and amount, with the delivery of the Bid to the County, shall result in the Bid being declared "non-responsive."
- B. A Bid Bond shall have as the surety thereon only such surety company or companies that are acceptable to the County and are authorized to write bonds of such character and amount in accordance with the qualifications established for Payment and Performance Bonds.
- C. The bid security submitted with the Bid becomes payable to the County upon default of the Bidder. Default of Bidder shall occur in the event that the Bidder withdraws Bid within 180 days after bid opening (or any extension thereof agreed to in writing by the Bidder and County); or, after proper notification of intent to Contract from the County, fails to comply with all pre-award requirements including, but not limited to providing Payment and Performance Bonds with good and sufficient surety and the necessary Insurance Certificates pursuant to the Contract Documents, and enter into a written Contract with the County, as may be required; all within 10 days after the prescribed forms are presented to Principal for signature or as otherwise required by these Bidding Documents.

1.03 CERTIFICATION PURSUANT TO ACT RELATING TO SCRUTINIZED COMPANIES

- A. This section shall apply only to the extent permitted under applicable regulations of the United States Department of State and the United States Department of Treasury.
- B. By submitting a bid executed through a duly authorized representative, the bidder certifies that the bidder is not on the Scrutinized Companies with Activities in Sudan List, Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, Scrutinized Companies that boycott Israel List or engaged in a boycott of Israel as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that the bidder is unable to provide such certification but still seeks to be considered for award of this solicitation, the bidder shall, on a separate piece of paper, clearly state that it is on one or both of the Scrutinized Companies lists and shall furnish together with its bid a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. The bidder agrees to cooperate fully with the County in any investigation undertaken by the County to determine whether the claimed exception would be applicable. The County shall have the right to terminate any contract resulting from this solicitation for default if the bidder is found to have submitted a false certification or to have been placed on the Scrutinized Companies for Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, Scrutinized Companies that boycott Israel List or engaged in a boycott of Israel.

1.04 SMALL BUSINESS ENTERPRISE-CONSTRUCTION PROGRAM

- A. Miami-Dade County web-based Business Management Workforce System (BMWS)
 - 1. Bidders must register under Miami-Dade County web-based Business Management Workforce System (BMWS). BMWS is managed by the Small Business Development (SBD) Division of the Internal Services Department. BMWS is utilize to apply online for Small Business

Enterprise (SBE) certification, manage County contracts, and track compliance with SBE Program measures, Workforce Program requirements, and subcontractor payments.

2. The use of this web-based system is mandatory for firms contracting with Miami-Dade County for the submission and verification of payment information and certified payrolls. Training for BMWS can be offered at the following web address: <https://mdcsbd.gob2g.com/>
1. BMWS is accessible, at no charge, to all vendors doing – or interested in doing – business with Miami-Dade County. Key features include:
 - a. Online application for Small Business Enterprise (SBE), Disadvantaged Business Enterprise (DBE) and Local Developing Business (LDB) certification
 - b. Online registration for the Equitable Distribution Program (EDP)
 - c. Enhanced online SBE, DBE, and LDB Directory, with key-word search capabilities
 - d. Electronic submission of subcontractors for fulfillment of SBE requirements
 - e. Electronic submission of contractors' utilization payments and verification of SBE payments via the web or a mobile device
 - f. Automated tracking of progress towards meeting SBE goals
 - g. Electronic submission of certified payrolls
 - h. Electronic submission of workforce compliance data
 - i. Automated notifications regarding compliance requirements
 - j. Elimination of/ or limited paper-based reporting

B. SBE-CONST Make-up Plan

1. A contractor that failed to meet an established Small Business Enterprise-Construction (SBE-CONST) goal on any contract must submit a SBE-CONST Make-up Plan for approval by the Miami-Dade County Internal Services Department, Small Business Division (SBD).
2. The SBE-CONST Make-up Plan along with a corresponding Certificate of Assurance (COA), located under Section 2 of these Solicitation and Contract Documents must be included with the Bid submittal at the time of bid. The corresponding COA must identify all SBE-CONST firms to be utilized to meet the first tier subcontractor goal and the trade designation of work that each firm will perform in satisfaction of a make-up, in addition to any other goals that may be applicable.
3. The Department will forward the Make-up Plan and COA(s) to SBD for compliance review. Bidders who fail to submit the SBE-CONST Make-up Plan and corresponding COA by the Bid due date and time will be considered "non-compliant."
4. Before the award, bidder must submit via County's web-based system Business Management Workforce System (BMWS) its commitment, that if awarded, the contractor, will fulfill all or a portion of any pending Small Business Enterprise Construction Services makeup requirements and identify the certified CSBE firm(s) to be utilized to fulfill the make-up requirements that is excess of any SBE goal(s) required on the project and the percentage dollar value and description of the work that needs to be made up within the time frame specified by SBD.

C. Small Business Enterprise-Construction Program Measures

1. In accordance with Miami-Dade County Ordinances No. 97-52, 14-98, and 97-158; A.O. 3-22, no SBE-CONST measures have been established for this Project.

1.05 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

- A. Disadvantaged Business Enterprise (DBE) Program does not apply for this Contract.

1.06 SITE INVESTIGATION

- A. Examine the Contract Documents and the site of the proposed work, when applicable, carefully before submitting a proposal for the work contemplated. Investigate the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished and as to the requirements of all Contract Documents.
- B. The Department does not guarantee the details pertaining to borings, as shown on the plans, to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. The Contractor shall examine boring data, where available, and make his own interpretation of the subsoil investigations and other preliminary data, and shall base his bid on his own opinion of the conditions likely to be encountered.
- C. The bidder's submission of a proposal is sufficient evidence that the bidder has made an examination as described in this Article. Therefore:
 1. The bidder, by virtue of submitting their bid, acknowledges that they and all their subcontractors have satisfied themselves as to the nature and location of the Work or requirements of similar Work to be performed within Miami-Dade County Public Right-of-Ways. The general and local conditions include, but are not restricted to those bearing upon transportation and traffic maintenance; the disposal, handling and storage of materials; access roads to the site; site constraints, restrictions and limitations; the conformation and conditions of the work area; and the character of equipment and facilities needed prior to and during the performance of the Work.
 2. Failure on the part of the bidder to completely or properly evaluate any factors of costs prior to bidding shall not form a basis for additional compensation if awarded the Contract.

1.07 CONTRACTOR QUALIFICATION REQUIREMENTS

- A. Certificate of Competency Requirement:
 1. At the time of Bid and pursuant to the requirements of Section 10-3 of the Code of Miami-Dade County, Florida and these Solicitation and Contract Documents, the Bidder must hold a valid, current, and active:
 - a. Certificate of Competency from the County's Construction Trades Qualifying Board as a General Engineering Contractor, General Contractor, Underground Utility/ Excavation Contractor.
 - b. The specialty contractor shall subcontract with a qualified contractor any work which is incidental to the specialty but is specified in the aforementioned Code as being the work of other than that of the Engineering Specialty for which certified as licensed plumber and electrical contractor.

- c. Certification, as a general contractor, provided by the State of Florida Construction Industry Licensing Board, pursuant to the provisions of Section 489.115 of the Florida Statutes (F.S.).

B. Experience Requirement:

1. The Bidder must demonstrate that it has full-time personnel with the necessary experience to perform the Project's Scope of Work. This experience shall include work in successfully completed projects performed by the identified personnel whose bulk of work performed in the Public Right-of-Way is similar in detail to the Project's Scope of Work described in these Solicitation Documents. Demonstrate the experience requirement by:
 - a. Providing a detailed description of all projects similar in detail to the Project's Scope of Work described in these Solicitation Documents and in which the Bidder's identified personnel is currently engaged or has completed within the past five years. List and describe the aforementioned projects and state whether the work was performed for the County, other government clients, or private entities. The description must identify for each project:
 - 1) The identified personnel and their assigned role and responsibilities for the listed project
 - 2) The client name and address including a contact person and phone number for reference
 - 3) Description of work
 - 4) Total dollar value of the contract
 - 5) Contract duration
 - 6) Statement or notation of whether Bidder's referenced personnel is/was employed by the prime contractor or subcontractor, and
 - 7) For completed projects, provide letters of certification of final acceptance or similar project closure documentation issued by the client and available Contractor's performance evaluations; or
2. The County reserves the right to request additional information and/or contact listed persons pertaining to bidder's experience.

1.08 JOB ORDER CONTRACTING

- A. Job Order Contracting under CICC 7360-0/08 does not apply for this contract.

1.09 AWARD OF CONTRACT

- A. The award of the Contract, if it be made in the County's sole discretion, shall be to the lowest responsive and responsible bidder whose bid complies with all of the material terms of this solicitation and is determined to be in the best interest of the County.
- B. A fully executed Notice to Proceed (NTP) Letter constitutes a contract with Miami-Dade County. The County may issue to the Contractor a NTP Letter only when, in the discretion of Miami-Dade County, all conditions for award have been satisfied including, but not limited to, compliance with all of the requirements set forth in the Recommendation for Award letter and the expiration of any applicable protest period. The Contractor must provide the County with the completed and fully

executed NTP Letter prior to the date stated in the letter for commencement of the Work. The award is final only upon the County's receipt of a fully executed NTP Letter from the Contractor.

- C. Without limiting the generality of the foregoing, the County may determine that it is in the County's best interest to award the Contract to the next low bidder when the low bidder's existing contractual commitments with the County, in the sole discretion of the County (a) could prevent the timely prosecution of the work requiring competing commitments of site, supervisory or home office personnel, or (b) could present potential conflicts with billing of similar items under existing contracts for similar or related work, or (c) could disfavor competition in the contracting industry in pricing or in the use of personnel or subcontractors.
- D. By submitting a bid, the bidder acknowledges that the County shall have the right to investigate the existence of these factors in determining whether to award the bid, and to evaluate, without limitation, the bidder's outstanding commitments on other awarded contracts, its resources to perform the Work under the Contract, and its past performance.
- E. The County reserves the right to waive any informality in, or to reject any or all bids. Bids from any person, firm or corporation in default upon any agreement with the County will be rejected.
- F. The Bidders should be qualified by experience, financing, and equipment to do the work described in the Contract Documents. The County may require from the apparent lowest responsive and responsible Bidder, as a condition for Award, a list of the major construction equipment that is available to perform all the work required by the Contract. The list shall include all equipment required and available including: quantity; condition; make and model; whether owned or leased; and their present location. Actual proof of ownership (bills of sale or certified proof of a valid lease in the name of the firm submitting the Bid) of the equipment or the ability to secure the equipment prior to Contract Award is required. A visual inspection by the County of the equipment listed shall be facilitated within 10 days of submittal of the aforementioned list. Failure to meet the timeframes and conditions stipulated herein or in the Recommendation for Award may result in the disqualification of the Bidder.

1.10 PAYMENT AND PERFORMANCE BONDS

- A. Unless otherwise exempted herein, the successful bidder must submit, within the timeframe stipulated in the Recommendation for Award, duly executed Payment and Performance Bonds, meeting the requirements of Section 255.05, F.S., on the forms prescribed by the Department or in Cash, each in the amount of the total contract price (i.e. the accepted total amount bid plus any contingency and dedicated allowances attributable to the Contract), as security for the faithful performance of this Contract and for the payment of all persons performing labor or furnishing materials in connection therewith. If Cash is used in lieu of the bonds, all terms and conditions stipulated in the bonds shall be just as applicable.
- B. Exemption. For contracts of \$200,000.00 or less for Community Small Business Enterprise (CSBE) work as either the (i) prime contractor directly contracting with a County department, or (ii) subcontractor of a prime contractor, there shall be no requirement for the CSBE firm entering into said contract or subcontract to execute and deliver a payment and performance bond as a condition of executing such contract or subcontract, or performing the work, unless pre-approved by Small Business Development.
 - A. The Performance and Payment Bonds shall have as the surety thereon only such surety company or companies as are acceptable to the County and are authorized to write bonds of such character and amount in accordance with the following qualifications:

1. All bonds shall be written through surety insurers authorized to do business in the State of Florida as surety, with the following qualifications as to management and financial strength according to the latest edition of Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey:

<u>Bond Amount (\$)</u>	<u>Best Rating</u>
500,001 to 1,500,000	B V
1,500,001 to 2,500,000	A VI
2,500,001 to 5,000,000	A VII
5,000,000 to 10,000,000	A VIII
Over 10,000,000	A IX

2. On contract amounts of \$500,000 or less, the bond provisions of Section 287.0935, F.S. shall be in effect and surety companies not otherwise qualifying with this paragraph may optionally qualify by:
 - a. Providing evidence that the Surety has twice the minimum surplus and capital required by the Florida Insurance Code at the time the invitation to bid is issued.
 - b. Certifying that the Surety is otherwise in compliance with the Florida Insurance Code, and;
 - c. Providing a copy of the currently valid Certificate of Authority issued by the United States Department of the Treasury under ss. 31 U.S.C. 9304-9308.
 3. Surety insurers shall be listed in the latest Circular 570 of the U.S. Department of the Treasury entitled "Surety Companies Acceptable on Federal Bonds", published annually. The bond amount shall not exceed the underwriting limitations as shown in this circular.
 4. For contracts in excess of \$500,000 the provision of Subarticle 2 above will be adhered to plus the company must have been listed for at least three consecutive years, or holding a valid Certificate of Authority of at least 1.5 million dollars and on the Treasury List.
 5. Surety Bonds guaranteed through U.S. Government Small Business Administration or Contractors Training and Development Inc. will also be acceptable.
 6. The attorney-in-fact or other officer who signs performance and payment bonds for a surety company must file with such bond a certified copy of his power of attorney authorizing him to do so. The performance and payment bonds must be counter signed by the surety's resident Florida agent.
- B. The Payment and Performance Bonds must be executed on the forms provided by the Department after the recommendation of award has been made. Failure to do so shall result in the rescission of the contract award recommendation.
- C. Provide the County with three executed originals of the Payment and Performance Bonds and a letter from the bonding agent granting Miami-Dade County authorization to date the Bonds.
- D. The Performance Bond or Cash used in lieu of the Performance Bond shall remain in force for five (5) years from the date of final acceptance of the work to protect the County against losses resulting from defects in materials or improper performance of work under the Contract; provided however, that this limitation does not apply to suits seeking damages for latent defects in materials or

workmanship, such actions being subject to the limitations found in Section 95.11(3)(c), Florida Statutes.

- E. The cost of the bond(s) shall be included in the Total Amount Bid. No separate payment for the cost of said bond(s) shall be made by the County.
- F. The required bond(s) shall be written by or through and countersigned by a licensed Florida agent of the surety insurer pursuant to Section 624.425, F.S.
- G. In the event the Surety on the bond(s) given by the Contractor becomes insolvent, or is placed in the hands of a receiver, or has its right to do business in its State of domicile or the State of Florida suspended or revoked as provided by law, or in the event of cancellation of the required hands by the Surety, the County shall withhold all payments until the Contractor shall give good and sufficient bond(s) in lieu of the bond(s) executed by such Surety.

1.11 ADDITIONAL INSURANCE TO BE CARRIED BY CONTRACTOR

Subparagraphs 2.9A through 2.9C and 2.9E through 2.9G of the Special Conditions to the CICC 7360-0/08 Contract are deleted and replaced with the following:

- A. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.
- B. Commercial General Liability Insurance in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate, not to exclude Products and Completed Operations and Explosion Collapse and Underground Hazards. **Miami-Dade County must be shown as an additional insured with respect to this coverage.**
- C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.
- D. Pollution Liability Insurance in an amount not less than \$1,000,000 per occurrence covering third party claims, remediation expenses, and legal defense expenses arising from on-site and off-site loss, or expense or claim related to the release or threatened release of Hazardous Materials that result in contamination or degradation of the environment and surrounding ecosystems, and/or cause injury to humans and their economic interest.
- E. Umbrella Liability Insurance in an amount not less than \$3,000,000 per occurrence, and \$3,000,000 in the aggregate.
 - If Excess Liability is provided must be follow form for coverages B and C.
- F. Completed Value Builders' Risk Insurance on an "all risk" basis in an amount not less than one hundred (100%) percent of the completed contract value. The policy shall be in the name of Miami Dade County and the Contractor.

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than “A-” as to management, and no less than “Class VII” as to financial strength, by Best’s Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest “List of All Insurance Companies Authorized or Approved to Do Business in Florida” issued by the State of Florida Department of Financial Services.

Miami Dade County reserves the right, upon reasonable notice, to request and examine the policies of insurance (including but not limited to policies, binders, amendments, exclusions, or riders, etc.).

NOTE: CERTIFICATE HOLDER MUST READ:

**MIAMI-DADE COUNTY
111 NW 1st STREET
SUITE 2340
MIAMI, FL 33128**

A.

SECTION 4: SUPPLEMENTAL INFORMATION

SAMPLE SURETY PERFORMANCE AND PAYMENT BOND

SURETY PERFORMANCE AND PAYMENT BOND

By this Bond, We _____, as Principal, whose principal business address is _____, as Contractor under the contract dated _____, 20 __, between Principal and Miami-Dade County for the construction of _____ Project No. _____ (herein after referred to as "Contract") the terms of which Contract are incorporated by reference in its entirety into this Bond and _____, a corporation, whose principal business address is _____ as Surety, are bound to Miami-Dade County (hereinafter referred to as "County") in the sum of _____ (U.S. dollars) \$ _____, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs all the work under the Contract, including but not limited to guarantees, warranties and the curing of latent defects, said Contract being made a part of this bond by reference, and in the times and in the manner prescribed in the Contract, including any and all damages for delay; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the contract; and
3. Pays County all losses, damages, including damages for delay, expenses, costs and attorney's fees, including appellate proceedings, that County sustains because of a default by Principal under the Contract, including but not limited to a failure to honor all guarantees and warranties or to cure latent defects in its work or materials within 5 years after completion of the work under the Contract; and
4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the Contract, including all warranties and curing all latent defects within 5 years after completion of the work under the Contract;

then this bond is void; otherwise it remains in full force.

If no specific periods of warranty are stated in the Contract for any particular item or work, material or equipment, the warranty shall be deemed to be a period of one (1) year from the date of final acceptance by the County. This Bond does not limit the County's ability to pursue suits directly with the Principal seeking damages for latent defects in materials or workmanship, such actions being subject to the limitations found in Section 95.11(3) (c), Florida Statutes.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this Bond.

SURETY PERFORMANCE BOND (Cont'd)

IN WITNESS WHEREOF, the above bounden parties have caused this Bond to be executed by their appropriate officials as of the _____ day of _____, 20 __.

CONTRACTOR

(Contractor Name)

BY:

(President) (Managing Partner or Joint Venture)

(SEAL)

COUNTERSIGNED BY RESIDENT
FLORIDA AGENT OF SURETY:

SURETY:

(Copy of Agent's current
Identification Card as issued by

State of Florida Insurance Commissioner must be attached) By: _____

Attorney-in-Fact

(CORPORATE SEAL)

(Power of Attorney must be attached)

SECTION 5: SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS

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1. SUPPLEMENTARY CONDITIONS

1.01 MISCELLANEOUS CONSTRUCTION CONTRACT (7360 PLAN)

- A. These Supplementary Conditions amend or supplement the Miscellaneous Construction Contract (MCC) CICC 7360-0/08 the MCC, 7360 Plan, and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect. All requirements of the Contract Documents, or portions thereof, which are not specifically modified, deleted, or superseded hereby, remain in full effect. The MCC Contract and Plan may also be supplemented elsewhere in the Contract Documents by provisions located in, but not necessarily limited to, Division 1 (General Requirements) of the Contract Specifications.

1.02 APPLICABLE WAGE RATES

- A. Amend Paragraph 2.17 of the CICC 7360-0/08 Miscellaneous Construction Contract by adding the following:

On May 28, 2024, the Governor signed into law House Bill ("HB") 705. Prior to the adoption of HB 705, section 255.0992 of the Florida Statutes generally prohibited Miami-Dade County (the "County"), from requiring a contractor, subcontractor, or supplier to pay or provide a predetermined amount of wages or benefits to its employees or recruit or hire employees from a designated or restricted source in construction projects paid for with any state-appropriated funds. Additionally, under the same statute, the County could not apply small business measures or limit bidding among Small Business Enterprise-Construction ("SBE-Con") firms for construction projects paid for with any state funds. However, for contracts funded solely with County funds, prior to the adoption of HB 705, section 255.0992 did not limit the application of the County's SBE-Con program, responsible wages, or workforce requirements.

No RESPONSIBLE WAGES AND BENEFITS apply for this project.

1.03 CONTINGENCY ALLOWANCE FOR TIME

- A. Paragraph 2.58 of the CICC 7360-0/08 Miscellaneous Construction Contract is hereby amended to provide a Contingency Allowance for time extension not to exceed ten percent of the original Contract Duration pursuant to a written request by Contractor for a time extension for an Excusable Delay, as described in Paragraph 2.58 of the 7360 Miscellaneous Construction Contract, that affects the critical path schedule of the Contract or any previously approved changes. The request must be accompanied by written documentation that supports the justification of a time extension and is subject to review and concurrence by the department Engineer, or designee. If approved, a Contract Contingency Allowance Expenditure Authorization will be created for execution by all parties. Once executed the time extension will adjust the scheduled completion date. The cumulative total of all Contingency Allowance time extensions shall not exceed ten percent of the original Contract Duration rounded off to the next whole number.

1.04 WEATHER DELAYS

- A. Schedule of Anticipated Weather Delay Days

- 1. The following schedule of average climatic range, based on National Oceanic and Atmospheric Administration (NOAA) normal data (1981-2010 Monthly Normals; GHCN Daily ID:

USW00012839; MIAMI INTL AP, FL), will be used as the standard baseline for monthly evaluations of weather delays for this Contract.

Schedule of Anticipated Weather Delay Days												
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Days	3	4	4	4	7	12	11	13	13	8	4	4

2. The above schedule provides the anticipated number of days each month during which construction activity exposed to weather conditions is expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days listed in the schedule, for each month, is included in the Work and is not eligible for extension of Contract Time. The Work Progress Schedule submitted by Contractor must reflect these anticipated adverse weather delays in all weather dependent activities.

B. Extension of Contract Time for Adverse Weather Days In Excess of the Standard Baseline

1. If the basis exists, in accordance with the Conditions of the Contract, for a claim for extension of time, an extension of time on the basis of weather may be granted only for the number of Weather Delay Days in a month that are in excess of the number of days listed above for that month in the Schedule of Anticipated Adverse Weather Delay Days.
2. Adverse Weather Day is defined, for the purpose of this Article, as the occurrence of one or more of the following weather conditions within a twenty-four (24) hour day that prevents scheduled critical path construction activity exposed to weather conditions:
 - a. Precipitation in excess of one-tenth inch (0.10").
 - b. Temperatures that do not rise above that required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice.
 - c. Sustained wind in excess of twenty-five (25) miles per hour.
3. Adverse Weather Day may include "dry-out" days, resulting from precipitation that occurs beyond the Anticipated Weather Delay Days for the month, only if there is a hindrance to site access or sitework and Contractor has taken all reasonable accommodations to avoid such hindrance; and, at a rate no greater than 1 make-up day for each precipitation day (or consecutive days) that total 1.0 inch or more of precipitation.
4. A Weather Delay Day may be counted by the Engineer, if adverse weather prevents work on the Project for fifty percent (50%) or more of the Contractor's normal scheduled work day and critical path construction activities were included in the day's schedule, including a weekend day or holiday approved by the Engineer with construction activity scheduled that day.
5. No additional compensation will be made for weather delays.

C. Contractor Documentation and Submittals

1. Organize claim to facilitate evaluation by calendar month and submit in accordance with the claims submittal requirements of the Contract Documents. Documentation is required for each Adverse Weather Day that results in a Weather Delay. Identify the number of days claimed for the month that exceeds the Schedule of Anticipated Adverse Weather Delays. Documentation must include:

- a. Daily jobsite work logs showing which and to what extent critical path construction activities have been affected by adverse weather.
 - b. Daily weather data, obtained from the nearest NOAA weather station or other independently verified source approved by Engineer at beginning of the Project, to support claim for time extension. NOAA Global Historical Climatology Network (GHCN) Daily data may be obtained from the NOAA website at <http://www.ncdc.noaa.gov/cdo-web/search>.
2. If an extension of Contract Time is appropriate and approved by the Department, such extension will be made in accordance with the requirements of the Contract Documents.

1.05 ADDITIONAL FUNDING SOURCE PROVISIONS

1. Causeway Toll Revenue
2. Contractor must comply with all requirements of the funding sources(s) for work issued under this Contract. This contract is being funded, in whole or in part, with Miami-Dade County funding sources including Causeway Toll Revenue.

1.06 ADDITIONAL SBE-CONST CONTRACT MEASURE REQUIREMENTS

- A. Considering the passing of HB 705, effective July 1, 2024, the following prohibitions exist:
- B. The County's Community Workforce Program requirements will not be applied to the County's capital construction projects, including design-build projects, awarded after July 1, 2024..

1.07 PROMPT PAYMENTS AND RETAINAGE:

1. In addition to Miami-Dade County Sec. 2-8.1.4. Sherman S. Winn Prompt Payment Ordinance and Administrative Order No.: 3-19 Prompt Payment, contractors, subcontractors and the County must also meet the requirements of Title 49 CFR part 26.29 and 26.37 and the Florida Prompt Pay Act. Prime contractors must pay subcontractors, including DBE'S, for satisfactory performance of their contracts no later than 30 calendar days after the date on which the payment request or a "*proper invoice*" is stamped received. Further, the prime contractor will return retainage payments to the subcontractor within 30 days of the sub-contractor's satisfactory completion of work.
2. Proper Invoice means an invoice which conforms to the present requirements of the County's finance system, which includes the issuance of a valid purchase order or contract as well as applicable change orders or amendments, and any rules promulgated from time to time by Administrative Order of the Mayor. A proper invoice must include a statement by the vendor/contractor waiving claims for extra direct and indirect costs or time associated with work preceding the date of the invoice, or a statement in sufficient detail containing all rights reserved for work already performed. All present requirements or future rules pertaining to the execution of a proper invoice are available to contractors at the pre-construction meeting.
3. In any case in which an improper invoice is submitted by a contractor, the County will, within ten (10) days after the improper invoice is received by it, notify the contractor that the invoice is improper and indicate what corrective action on the part of the vendor is needed to make the invoice proper.

4. In the event a dispute occurs between the contractor and the County concerning payment of an invoice, such disagreement shall be resolved not later than forty-five (45) days after the date on which the improper invoice was received by the County and shall be concluded by final written decision of the Mayor or his or her designee(s), not later than sixty (60) days after the date on which the improper invoice was received by the County.
5. If the dispute is resolved in favor of the contractor, then interest shall begin to accrue as of the original date the payment became due.
6. All payments due from the County and are not made by the appropriate due date as described above, shall bear interest from thirty (30) days after the appropriate due date at the rate of one (1) percent per month on the unpaid balance. One (1) month shall constitute a period beginning on any day of a month and ending on the same day of the following month. Any overdue period of less than one (1) month shall be considered as one (1) month in computing interest. Unpaid interest shall compound monthly.
7. The vendor must be responsible for preparing and delivering an invoice to the County for any interest accrued in order to receive the interest payment. The invoice must include the following:
 - a. Date proper invoice received by County, its applicable invoice number and amount.
 - b. Date punch list was completed.
 - c. Date and corresponding reference number of applicable purchase order, requisition or contract.
 - d. Payment due date.
 - e. Date interest commences.
 - f. Interest due at one percent per month on unpaid balance.
8. Contractor may not hold retainage from its subcontractors and is required to return any retainage payments to those subcontractors within 30 days after the subcontractor's work related to this contract is satisfactorily completed or within 30 days after incremental acceptance of the subcontractor's work by the County and contractor's receipt of the partial retainage payment related to the subcontractor's work, whichever comes first.

1.08 COMMUNITY WORKFORCE PROGRAM

- A. Considering the passing of HB 705, effective July 1, 2024, the following prohibitions exist:

The County's Community Workforce Program requirements **will not be applied** to the County's capital construction projects, including design-build projects, awarded after July 1, 2024.

1.09 CLEARINGHOUSE FOR POSTING NOTICE OF JOB OPPORTUNITIES

- A. Pursuant to Miami-Dade County Resolution R-1145-99, Contractor must post a notice of job opportunities with the Miami-Dade County Job Clearinghouse (JCH) within ten (10) business days of the contract award or no later than five (5) business days after start of construction. If job opportunities are available, complete all portions of the Notice of Construction Clearinghouse Job Opportunity form (Form B). If no job opportunities are available, complete a JCH Affidavit- No Notice(s) of Construction Job Opportunities form (Form C). Submit the completed Form B or C (with copies to the Engineer) to:

Miami-Dade County Internal Service Department
Small Business Development Division
Project Review and Analysis Section
Attention: Job Clearinghouse
111 NW 1st Street, 19th floor
Miami, Florida 33128
Telephone: (305) 375-3111 Fax (305) 375-3160

- B. Job applicants interested in posting an application for employment to be considered by contractors with job openings may complete a JCH Construction Clearinghouse Job Application (Form A) and submit it to the address provided in the Form.
- C. The necessary forms are provided as Appendix "A" to these Supplementary Conditions. Additional information pertaining to the Miami-Dade County Job Clearinghouse is available in the County's website at <http://www.miamidade.gov/sba/about-us-job-clearinghouse.asp>.

1.10 RESIDENTS FIRST TRAINING AND EMPLOYMENT PROGRAM COMPLIANCE

- A. Considering the passing of HB 705, effective July 1, 2024, the following prohibitions exist:

The County's Residence First Training and Employment Program requirements **will not be applied** to the County's capital construction projects, including design-build projects, awarded after July 1, 2024.

1.11 EMPLOY MIAMI-DADE PROGRAM

- A. Considering the passing of HB 705, effective July 1, 2024, the following prohibitions exist:

The County's Employ Miami-Dade Program requirements **will not be applied** to the County's capital construction projects, including design-build projects, awarded after July 1, 2024.

1.12 ACCEPTANCE TESTS

- A. Replace Article 2.89 of the CICC 7360-0/08 Miscellaneous Construction Contract with the following:
- B. When Contractor informs Engineer that the Work is ready for inspection and testing, Engineer may request, from a County approved laboratory, the tests necessary to confirm that the required material, compaction, or work specifications are met. If the results of the tests reveal that the applicable specifications have not been met, Contractor, without additional compensation, must perform, to the satisfaction of Engineer, all work necessary to meet the applicable specifications and is responsible for the costs of all re-testing required by Engineer and the Contract Documents.
- C. The Department will pay the laboratory for the first test (pass or fail); any re-testing will be the responsibility of Contractor. The Department will only pay for re-testing when authorized, in writing, by Engineer.
- D. Contractor must comply with the conditions of the agreement between Miami-Dade County and Laboratory.

1.13 CHANGE ORDER PROCEDURES AND BASIS FOR PAYMENT

- A. Extra Work shall result in an equitable adjustment (increase or decrease) to the applicable RPQ representing the reasonable cost or the reasonable financial savings related to the change in Work. Extra Work may also result in an equitable adjustment in the RPQ schedule for performance for both the Extra Work and any other Work affected by the Extra Work.
- B. The County shall initiate the Extra Work procedure by a notice to Contractor outlining the proposed Extra Work. Upon receipt of the notice to proceed with the Extra Work, the Contractor is required to immediately start the Extra Work. The Contractor is required to obtain permission for an extension to start the Extra Work if it is beyond the Contractor's ability to start within the allotted timeframe.
- C. The Contractor is required to provide the Project Manager with a detailed Change Order Proposal, if an Owner's Representative has been identified, which shall include requested revisions to the Contract, including but not limited to adjustments in the RPQ price and schedules for performance for the applicable RPQ. The change to the RPQ shall not exceed \$100,000 or 10% of original RPQ, whichever is less. The Contractor is required to provide sufficient data in support of the cost proposal demonstrating reasonableness. In furtherance of this obligation, the County may require that the Contractor submit any or all of the following: a cost breakdown of material costs, labor costs, labor rates by trade, and Work classification and overhead rates in support of Contractor's Change Order Proposal. The Contractor's Change Order Proposal must include any schedule revisions and an explanation of the cost and schedule impact of the extra Work on the project. If the Contractor fails to notify the Project Manager of the schedule changes associated with a Notice of Proposed Change Order by submitting a revised schedule document, it will be deemed to be an acknowledgment by Contractor that the proposed Extra Work will not have any scheduling consequences. The Contractor agrees the Change Order Proposal will in no event include a combined profit and home office overhead rate in excess of fifteen (15%) percent of the direct labor and material costs, unless the Project Manager determines that the complexity and risk of the Extra Work is such that an additional factor is appropriate. The Change Order Proposal may be accepted or modified by negotiations between the Contractor and the County. If an agreement on the Extra Work is reached, both parties shall execute the Extra Work order in writing. The execution by the Contractor of the Extra Work order shall serve as a release of the County from all claims and liability to the Contractor relating to, or in connection with, the Extra Work, including any impact, and any prior acts, neglect or default of the County relating to the Extra Work.

1.14 MIAMI-DADE COUNTY'S USER ACCESS PROGRAM (UAP).

- A. On November 5, 2013 the Board of County Commissioners adopted Ordinance No. 13-103 eliminating the construction contract exemption to the User Access Program set forth in Section 2-8.10 of the Code of Miami-Dade County with the exception of Miscellaneous Construction Contract Program contracts with a total contract value of less than \$500,000. Ordinance No. 13-103 retained the other exemptions listed in Section 2-8.10 of the Code including an exemption for contracts "funded with any funding source, including federal, which prohibits or restricts the application of the credit to the County effected in the UAP." As bond funding would be a funding source "which prohibits or restricts the application" of the UAP, construction contracts funded by bond proceeds (e.g., General Obligation Bond (GOB), People's Transportation Plan (PTP)) remain exempt from the application of the County's User Access Program.
- B. UAP does apply for this project, Therefore:
- C. This Contract is subject to a user access fee under the County's User Access Program (UAP) in the amount of two percent (2%) pursuant to Miami-Dade County Budget Ordinance No. 03-192. All construction services provided under this contract are subject to the 2% UAP. This fee applies to all Contract usage whether by County Departments or by any other governmental, quasi-

governmental or not-for-profit entity. From every payment made to the Contractor under this contract (including the payment of retainage), the County will deduct the two percent (2%) UAP fee provided in the ordinance and the Contractor will accept such reduced amount as full compensation for any and all deliverables under the contract. The County shall retain the 2% UAP for use by the County to help defray the cost of its procurement program. Contractor participation in this pay request reduction portion of the UAP is mandatory.

1.15 PUBLIC RECORDS AND CONTRACTS FOR SERVICES PERFORMED ON BEHALF OF MIAMI-DADE COUNTY.

- A. The Contractor shall comply with the Public Records Laws of the State of Florida, including but not limited to,:
 - 1. Keeping and maintaining all public records that ordinarily and necessarily would be required by Miami-Dade County (County) in order to perform the service
 - 2. Providing the public with access to public records on the same terms and conditions that the County would provide the records and at a cost that does not exceed the cost provided in Chapter 119, F.S., or as otherwise provided by law
 - 3. Ensuring that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and
 - 4. Meeting all requirements for retaining public records and transferring, at no cost, to the County all public records in possession of the Contractor upon termination of the contract and destroying any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements upon such transfer.
- B. In addition, all records stored electronically must be provided to the County in a format that is compatible with the information technology systems of the County. Failure to meet any of these provisions or to comply with Florida's Public Records Laws as applicable shall be a material breach of the agreement and shall be enforced in accordance with the terms of the agreement.
- C. For questions regarding the application of chapter 119, Florida Statutes, to The Contractor's Duty to Provide Public Records relating to this contract, contact the Custodian of Public Records at (305) 375-4735; isd-vss@miamidade.gov; 111 NW 1 Street, suite 1300, Miami, Florida 33128.

1.16 NONDISCRIMINATION

- A. During the performance of this Contract, Contractor agrees to not discriminate against any employee or applicant for employment because of race, color, religion, ancestry, national origin, sex, pregnancy, age, disability, marital status, familial status, sexual orientation, gender identity or gender expression, status as victim of domestic violence, dating violence or stalking, or veteran status, and on housing related contracts the source of income, and will take affirmative action to ensure that employees and applicants are afforded equal employment opportunities without discrimination. Such action shall be taken with reference to, but not limited to: recruitment, employment, termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on the job training.
- B. By entering into this Contract, the Contractor attests that it is not in violation of the Americans with Disabilities Act of 1990 (and related Acts) or Miami-Dade County Resolution No. R-385-95. If the

Contractor or any owner, subsidiary or other firm affiliated with or related to the Contractor is found by the responsible enforcement agency or the County to be in violation of the Act or the Resolution, such violation shall render this Contract void. This Contract shall be void if the Contractor submits a false affidavit pursuant to this Resolution or the Contractor violates the Act or the Resolution during the term of this Contract, even if the Contractor was not in violation at the time it submitted its affidavit.

1.17 CONTRACTOR DUE DILIGENCE AFFIDAVIT

- A. In accordance with Board of County Commissioners Resolution 63-14, Contractor, as a condition of award, must submit Contractor Due Diligence Affidavit Form on any contract that exceeds \$1 million, or that is otherwise subject to Board approval.
 - 1. Affidavit is attached in Section 2 of these Solicitation Documents and must be included in the solicitation package. Form requires that Contractors attest to the following under oath:
 - a. All of the lawsuits that have been filed against that entity, its directors, partners, principals, and/or board members, based on breach of contract by that entity in the five years prior to bid or proposal submittal, including the case name and number and the disposition of the case;
 - b. Any instances in the five years prior to bid or proposal submittal where that entity has been defaulted and a brief description of the circumstances; and
 - c. All of the instances in the five years prior to bid or proposal submission where that entity has been debarred or received a formal notice of non-compliance or non-performance, such as a notice to cure or a suspension from participating or bidding for contracts, whether related to Miami-Dade County or not.
- B. It is the responsibility of the Contractor to return the fully executed Affidavit at the time of bid or proposal submittal. This affidavit will be used as an additional measure of due diligence prior to award of a contract.

1.18 CLAIMS

- A. Amend Paragraph 2.78 of the CICC 7360-0/08 Miscellaneous Construction Contract by adding the following:
- B. Notice of Claims
 - 1. The Contractor will not be entitled to additional time or compensation otherwise payable for any act or failure to act by the Department, the happening of any event or occurrence, or any other cause, unless he shall have given the Project manager a written notice of claim therefore as specified in this article.
 - 2. The Contractor shall provide immediate verbal notification with written confirmation within forty-eight (48) hours of any potential claims and of the anticipated time and/or cost impacts resulting thereof. The written notice of claim shall set forth the reasons for which the Contractor believes additional compensation and/or time will or may be due, the nature of the costs involved and the approximate amount of the potential claim.
 - 3. It is the intention of this article, that differences between the parties arising under and by virtue of the Contract shall be brought to the attention of the Project Manager at the earliest possible

time in order that such matters may be settled, if possible, or other appropriate action promptly taken.

4. The notice requirements of this article are in addition to those required in other articles of these Contract Documents, inclusive of the conditions listed under the MCC Plan.
5. The Contractor shall segregate all costs associated with each individual claim including but not limited to labor, equipment, material, subcontractor and supplier costs, and all other costs related to the claim. In the event that the Contractor has multiple claims, the Contractor will segregate each claim individually including the respective costs associated with each claim. Failure to segregate claims and their respective costs will be grounds for the Department's rejection of the claim. No "total cost claims" shall be allowed under this Contract.
6. The Contractor must maintain a cost accounting system as a condition for making a claim against the Department. The cost accounting system must segregate the costs of the work under the Contract (non-claims-related) from claims-related and other Contractor costs through the use of a job cost ledger and be otherwise in compliance with general accounting principles.
7. If the Department decides to pay all or part of a claim for which notice was not timely made, the Department does not waive the right to enforce the notice requirements in connection with any other claim.
8. Inasmuch as the notice of claim requirements of this article are intended to enable the Project Manager to investigate while facts are fresh and to take action to minimize or avoid a claim which might be filed thereafter, the Contractor's failure to make the required notice on time is likely to disadvantage the Department. Therefore, a claim that does not comply with the notice requirements above shall not be considered unless the Contractor submits with his claim proof showing that the Department has not been prejudiced by the Contractor's failure to so comply and, in the event the Department has been prejudiced by the Contractor's failure to submit a timely notice of claim, the Department will reduce any equitable adjustment claimed by the Contractor to reflect the damage.

C. Claim Submittals

1. Claims or requests for equitable adjustments filed by the Contractor shall be filed in full accordance with this article no later than 30 calendar days after the act giving rise to the claim and in sufficient detail to enable the Department to ascertain the basis and amount of said claims. In the case of continuing or on-going claim events, the Contractor shall be allowed to periodically amend his claim to more accurately reflect the impact of said claim, until the end of the claim event. No claims for additional compensation, time extension or for any other relief under the Contract shall be recognized, processed, or treated in any manner unless the same is presented in accordance with this Article. Failure to present and process any claim in accordance with this Article shall be conclusively deemed a waiver, abandonment or relinquishment of any such claim, it being expressly understood and agreed that the timely presentation of claims, in sufficient detail to allow proper investigation and prompt resolution thereof, is essential to the administration of this Contract.
2. The Department will review and evaluate the Contractor's claims. It will be the responsibility of the Contractor to furnish, when requested by the Project manager, such further information and details as may be required to determine the facts or contentions involved in his claims. The cost of claims preparation or Change Order negotiations shall not be reimbursable under this Contract.
3. Any work performed by the Contractor prior to Notice-to-Proceed (NTP) shall not be the basis for a claim from the Contractor of any kind.

4. Each claim must be certified by the Contractor as required by the Miami-Dade Code, False Claims Act (see Code Section 21-255, et seq.), and accompanied by all materials required by Miami-Dade County Code Section 21-257. A "certified claim" shall be made under oath by a person duly authorized by the claimant, and shall contain a statement that:
 - a. The claim is made in good faith;
 - b. The claim's supporting data is accurate and complete to the best of the person's knowledge and belief;
 - c. The amount of the claim accurately reflects the amount that the claimant believes is due from the Department; and
 - d. The certifying person is duly authorized by the claimant to certify the claim.
5. In order to substantiate time-related claims (delays, disruptions, impacts, etc.), the Contractor shall, if applicable and as determined by the Department, submit, in triplicate, the following information:
 - a. Copy of Contractor's notice of claim in accordance with this article. Failure to submit the notice is sufficient grounds to deny the claim.
 - b. The approved, as-planned Schedule in accordance with the applicable section of the Contract Documents and computer storage media, if applicable.
 - c. The as-built Schedule reflecting changes to the approved schedule up to the time of the impact in question and computer storage media if applicable.
 - d. The basis for the duration of the start and finish dates of each impact activity and the reason for choosing the successor and predecessor events affected in the schedule shall be explained. Also, the basis for the duration of any lead/lags inserted into the schedule and the duration in related activity duration shall be explained.
 - e. A marked-up as-built Schedule indicating the causes responsible for changes between the as-planned and as-built schedule and establishing the required cause and effect relationships.
 - f. After indicating specific time related changes on the as-built schedule, the documentation must be segregated into separate packages with each package documenting a specific duration change identified previously. This documentation package shall include Change Orders, Change Notices, Work Orders, written directions, meeting minutes, etc., related to the change in duration.
 - g. Any loss of efficiency, acceleration, disruption and loss of productivity claims shall be compensated as part of the Liquidated Indirect Costs paid for compensable, excusable delays and mark-up on Direct Cost of changes as allowed by the Contract. Total cost and modified total cost claims will not be accepted and the Contractor agrees to waive the right to seek recovery by these methods. The claimed delay shall not result from a cause specified in the Contract Documents as a non-excusable delay.
 - h. The Contractor assumes all risk for the following items, none of which shall be the subject of any claim and none of which shall be compensated for except as they may have been included in the compensation described under Liquidated Indirect Costs:
 - 1) Home office expenses or any Direct Costs incurred allocated from the headquarters of the Contractor;
 - 2) Loss of anticipated profits on this or any other project;
 - 3) Loss of bonding capacity or capability;
 - 4) Losses due to other projects not bid upon;

- 5) Loss of business opportunities;
 - 6) Loss of productivity on this or any other project;
 - 7) Loss of interest income on funds not paid;
 - 8) Costs to prepare, negotiate or prosecute claims and
 - 9) Costs spent to achieve compliance with applicable laws and ordinances (excepting only sales taxes paid shall be reimbursable expense subject to the provisions of the Contract Documents).
- i. All non-time-related claim items for additional compensation for Direct Costs shall be properly documented and supported with copies of invoices, time sheets, rental agreements, crew sheets and the like.
 - j. Cost information shall be submitted in sufficient detail to allow for review. The basis for the budgeted or actual costs shall include man-hours by trade, labor rates, material and equipment costs etc. These costs shall be broken down by pay.
 - k. The documentation for budgeted cost shall, as a minimum, include:
 - 1) Copies of all the Contractor's bid documents, bid quotes, faxed quotes, etc.
 - 2) Copies of all executed subcontracts.
 - 3) Other related budget documents as requested by the Project Manager.
 - l. The documentation for actual cost shall, as a minimum, include:
 - 1) Time Sheets.
 - 2) Materials invoices
 - 3) Equipment invoices
 - 4) Subcontractors' payments
 - 5) Other related documents as required by the Project Manager.
 - m. The Contractor shall make all his books, employees, work sites and records available to the Department or its representatives for inspection and audit.
6. No payment shall be made to the Contractor by the Department for loss of anticipated profit(s) from any deleted work.
7. As indicated above, the Project Manager and the Field Representative shall be allowed full and complete access to all personnel, documents, work sites or other information reasonably necessary to investigate any claim. Within sixty (60) days after a claim has been received, the claim shall either be rejected with an explanation as to why it was rejected or acknowledged. Once the claim is acknowledged, the parties shall attempt to negotiate a satisfactory settlement of the claim, which settlement shall be included in a subsequent Work Order or Change Order. If the parties fail to reach an agreement on a recognized claim, the Department shall pay to the Contractor the amount of money it deems reasonable, less any appropriate retention, to compensate the Contractor for the recognized claim.
8. Failure of the Contractor to make a specific reservation of rights regarding any such disputed amounts in the body of the Change Order which contains the payment shall be construed as a waiver, abandonment, or relinquishment of all claims for additional monies resulting from the claims embodied in said Change Order. However, once the Contractor has properly reserved rights to any claim, no further reservations of rights shall be required and the Contractor shall not be required to repeat the reservation in any subsequent change order. Prior reservation of rights may however be modified, by express reference, in subsequent change orders.

Notwithstanding the aforementioned, at the time of final payment under the Contract, the Contractor shall specify all claims which have been denied and all claims for which rights have been reserved in accordance with this section. Failure to so specify any particular claim shall be constructed as a waiver, abandonment, or relinquishment of such claim.

1.19 DISPUTES

A. Amend Paragraph 2.81 of the CICC 7360-0/08 Miscellaneous Construction Contract by adding the following:

B. Disputes

1. The following provisions shall govern disputes under this Contract unless the Special Provisions to this Contract contain the requirement for the use of an alternate dispute resolution method. For example, for large projects of great complexity, a Dispute Review Board (DRB) may be employed by the Department to settle disputes in lieu of the Department Director or Office of the Mayor (OOM) designee as specified below. In this case, the DRB alternative shall be specified by the Department in the Special Provisions and, if utilized, shall supersede this dispute provision.
 - a. In the event the Contractor and the Department are unable to resolve their differences concerning any determination made by the Project Manager or Department on any dispute or claim arising under or relating to the Contract (referred to in this Section as a "Dispute"), either the Contractor or the Department may initiate a dispute in accordance with the procedure set forth in this article. Exhaustion of these procedures shall be a precondition to any lawsuit permitted hereunder.
 - b. For contracts with a value of \$5 million or less, all Disputes under this Contract shall be decided by the Department Director or his designee. For contracts valued at more than \$5 million, Disputes shall be decided by a designee appointed by the OOM. Decisions rendered by the Department Director or OOM designee shall not be binding but shall be admissible in a court of competent jurisdiction.
 - c. As soon as practicable, the Department Director or OOM designee shall adopt a schedule for the Contractor and the Department to file written submissions stating their respective positions and the bases therefore. The written submissions shall include copies of all documents and sworn statements in affidavit form from all witnesses relied on by each party in support of its position. Within 20 working days of the date on which such written submissions are filed, the Department Director or OOM designee shall afford each party an opportunity to present a maximum of one hour of argument. The Department Director or OOM designee may decide the Dispute on the basis of the affidavits and other written submissions if, in his opinion, there is no issue of material fact and the party is entitled to a favorable resolution pursuant to the terms of this Contract. As part of such decision, the Department Director or OOM designee shall determine the timeliness and sufficiency of each notice of claim and claim at issue as provided in this article. The Department Director or OOM designee shall have the authority to rule on questions of law, including disputes over contract interpretation, and to resolve claims, or portions of claims, via summary judgment where there are no disputed issues of material fact. Furthermore, the Department Director or OOM designee is authorized by both parties to strike elements of claims seeking relief or damages not available under the contract (such as, but not limited to, claims for lost profits, off-site overhead, loss of efficiency or productivity claims or claim's preparation costs) by summary disposition.
 - d. In the event that the Department Director or OOM designee determines that the affidavits or other written submissions present issues of material fact, he shall allow the presentation

of evidence in the form of lay or expert testimony directed solely to the issues which he may specifically identify to require factual resolution. The testimonial portion of the process shall not exceed one day in duration per side, including opening statements and closing arguments, if allowed by the Department Director or OOM designee at his reasonable discretion.

- e. No formal discovery shall be allowed in connection with any proceeding under this article. Notwithstanding the foregoing, both parties agree that all of the audit, document inspection, information and documentation requirements set forth elsewhere in this contract shall remain in force and effect throughout the proceeding. The Department Director or OOM designee shall not schedule the hearing until both parties have made all their respective records available for inspection and reproduction and the parties have been afforded reasonable time to analyze the records. The continued failure of a party to comply with the document inspection, examination, or submission requirements set forth in this contract shall constitute a waiver of that party's claims and/or defenses, as applicable. Hearsay evidence shall be admissible but shall not form the sole basis for any finding of fact. Failure of any party to participate on a timely basis, to cooperate in the proceedings, or to furnish evidence in support or defense of a claim shall be a criteria in determining the sufficiency and validity of a claim.
- f. The Department Director or OOM designee shall issue a written decision within 15 working days after conclusion of any testimonial proceeding and, if no testimonial proceeding is conducted, within 45 days of the filing of the last written submission. This written decision shall set forth the reasons for the disposition of the claim and a breakdown of any specific issues or subcontractor claims. As indicated previously, the decision of the Department Director or OOM designee is not binding on the parties, but will be admissible in a court of competent jurisdiction.
- g. If either party wishes to protest the decision of the Department Director or OOM designee, such party may commence an action in a court of competent jurisdiction, within the periods prescribed by law, it being understood that the review of the court shall be limited to the question of whether or not the Department Director or OOM designee's determination was arbitrary and capricious, unsupported by any competent evidence, or so grossly erroneous to evidence bad faith.
- h. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the Contract and in accordance with the Department's interpretation. Any presentation or request by the Contractor under this article will be subject to the same requirements for Submittal of Claims in this article.

1.20 EXTRA WORK

- A. The following Subarticle replaces the following items: Article 2.83, Extra Work and Payment Therefore, of the Special Conditions of the MCC 7360 Plan.
 - 1. Contractor may be asked to perform extra work, for which there is no price included in the Proposal, wherever it is deemed necessary or desirable by the Engineer to satisfactorily complete the Project as contemplated, and such extra work must be performed promptly in accordance with the Specifications and as directed by the Engineer, provided, however, that before any extra work is begun, a written order from the Engineer to do the work shall be given to the Contractor. No extra work will be paid for unless ordered in writing.
 - 2. All changed or added work so authorized shall be performed by the Contractor at the time and in the manner specified.
 - 3. The Change Order shall include, as a minimum:

- a. Scope of work to be added, deleted or modified;
 - b. Cost of work to be added, deleted or modified;
 - c. The Contract time extension or reduction in contract time in the case of deleted work required to perform the work to be added, deleted or modified;
 - d. Full release of claims associated with the Contract through the date of the change order, or a reservation of claims identified as to each claim reserved, the scope of the work, the maximum cost of the work, and the maximum number of days of Contract time requested, shall be specified.
4. The Work Order shall include, at a minimum:
- a. Scope of work to be added, deleted or modified;
 - b. Cost of work to be added, deleted or modified;
 - c. The Contract time extension required to perform the work to be added, deleted or modified;
 - d. Full release of claims associated with the work order work, or a reservation of claims identified as to each claim reserved, the scope of the work, the maximum cost of the work, and the maximum number of days of Contract time requested, shall be specified.

B. Extra Work Payment

1. The following Subarticle replaces the following items: Article 2.83, Extra Work and Payment Therefore, of the Special Conditions of the MCC 7360 Plan.
2. If Work is ordered, changed, or deleted which is not covered by Unit Prices, then, a NAM must be executed.
3. Extra work, for a complete job, will be paid for in a lump sum or at unit prices agreed to in writing by the Engineer and the Contractor before the extra work is ordered for performing the work. Payment for lump sum work will be based on the following:
 - a. Contractor shall submit to the Engineer an estimated proposal containing a complete breakdown of costs to perform the work to which shall be added an amount equal to fifteen (15) percent of such sum for labor and the total thereof will be full compensation to the Contractor for performing the work which includes overhead and profit, home office expenses for general supervision and for furnishing and repairing small tools and ordinary equipment used in doing the extra work. In addition, the Contractor shall include their labor burden costs of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension plans, vacations and insurance and Contractor's public liability and property damage insurance involved in such extra work, based on the wages paid to such labor. Contractor's documentation of the labor burden costs must be provided upon demand by the Engineer.
 - b. For all materials used, Contractor will include the estimate total cost of such materials, including taxes and freight charges, to which cost will be, added an amount equal to ten (10) percent thereof; for full compensation that includes overhead, profit and home office expenses.
 - c. For any construction equipment or special equipment including fuel and lubricant required for the economical performance of extra work, the Engineer will pay the Contractor a rental price, for every hour that such construction equipment or special equipment is estimated to operate on the work. This provision is intended to pay for heavy or special construction equipment; the County shall therefore not pay for small tools and equipment ordinarily used

in construction. Where there is a question as to whether payment pursuant to this section is valid the Engineer will make the final determination as to the validity of such payment. The hourly rental price of such construction or special equipment will not exceed 1/176 part of the monthly rate stated for such equipment in the latest edition of the "Compilation of Rental Rates for Construction Equipment" by Associated Equipment Distributors. In the event that the equipment is not owned by the Contractor or his companies and the equipment is rented from a recognized equipment rental company, the Contractor will be paid the estimated time that the equipment will work at the hourly rental rate to which shall be added ten (10) percent for fuel, maintenance and lubrication for rented equipment.

4. Contractor is required to include a statement certifying that the proposal is consistent with the Plans and Specifications and he has reviewed all the costs for extra work and has found them to be accurate, fair and reasonable. If extra work is ordered, it must be included in the Contractor's monthly estimate when Allowance Account funds are available in the Contract for the work actually done. An Allowance Account expenditure form shall be prepared and executed by all appropriate parties to the Contract. If no allowance account funds are available a change order will be issued.
5. The performance of any extra work or the furnishing of any extra material which, in the judgment of the Engineer, is of like character to and susceptible of classification under a unit price item of the Contract shall, if the order of the Engineer shall so provide, be paid for at the unit price bid for such item or items, where Allowance Account funds are available in the Contract with the Contractor's monthly estimate, for the work actually done. Said Allowance Account funds shall be transferred to the various Proposal payment item funds via the Allowance Account expenditure form, to allow payment for this extra work without depletion of the payment item fund.
6. All extra work performed hereunder will be subject to all of the provisions of the Contract. Whenever, in the judgment of the Engineer, such extra work or such extra material is not of like character to and susceptible of classification under a unit price item of the Contract, or the application of the unit price will result in unacceptably high costs to the Department, and it is impracticable because of the nature of the work, or for any other reason, to fix the price before the extra work order is issued, extra work and material will be paid for in the following manner:
 - a. For all labor, including a working foreman in direct charge of the specified operation, the Contractor will receive a sum equal to the current local rate of wages for every hour that the labor is actually performed. For a working foreman who performs labor, the Contractor may charge one hundred (100) percent of his hourly wage rate; for a foreman who only directs workers in the performance of their work, the Contractor may charge the following: twenty five (25) percent of the working foreman's salary for directing up to two workers in their work; fifty (50) percent of sum salary for directing up to four workers in their work; seventy-five (75) percent for directing five workers in their work; and one hundred (100) percent for directing six workers or more their work, to which shall be added an amount equal to fifteen percent of such sum, and the total thereof shall be full compensation to the Contractor for performing the work, which includes overhead and profit, home office expenses, general supervision and for furnishing and repairing small tools and ordinary equipment used in doing the extra work. In addition, the Contractor shall be paid their labor burden costs of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension plans, vacations, and insurance and contractor's public liability and property damage insurance involved in such extra work, based on the actual wages paid to such labor.
 - b. For all materials used, the Contractor shall receive the actual cost of such materials, including freight charges as shown by original receipted bills, to which costs will be added

an amount equal to ten (10) percent thereof, for full compensation which includes overhead, profit and home office expenses.

- c. For any construction equipment or special equipment including fuel and lubricants, required for the economical Performance of extra work, excluding the small tools and ordinary equipment as specified above, the Engineer shall allow the Contractor a rental price to be agreed upon in writing before such work is begun, for every hour that such construction equipment or special equipment is actually operated on the work. Such hourly rental price shall not exceed 1/176 part of the monthly rate stated for such equipment in the latest edition of the "Compilation of Rental Rates for Construction Equipment" by Associated Equipment Distributors. In the event that the equipment is not owned by the Contractor or his companies and the equipment is rented from a recognized equipment rental company, the Contractor will be paid for every hour that the equipment is actually working at the hourly rental rate to which will be added ten (10) percent for fuel, maintenance and lubricants for rented equipment.
7. Contractor's representative and the Counties representative will compare records of extra work done at the end of each day. Such records will be made in duplicate upon a form provided for such purpose by the Counties representative, and shall be signed by both the counties representative and the Contractor's representative, one copy being submitted to the Engineer and the other being retained by the Contractor.
8. Contractor upon certified statements will submit all claims for extra work done, to which shall be attached the original receipted bills covering the costs of and freight charges on all materials used in such work, and such statements, accompanied by copies of the orders authorizing the performance of the work, shall be submitted to the Engineer for inclusion in the estimate of month. In which the work was actually done, where allowance account funds are available in the contract. If no allowance account fund is available, the extra work shall be paid for, subject to approval of a change order for the work, by the county representative via Expedite Ordinance or the Board of County Commissioners.
9. If required, the Contractor shall produce any books, vouchers, other records, or memoranda that will assist the Engineer in determining the true, necessary cost of work and materials to be paid for on a cost plus basis.
10. In the event that the Contractor employs a subcontractor to perform his extra work for any portion of the lump sum work, or for any portion of extra work, material or equipment. Contractor may charge an additional ten (10) percent for his full compensation for overhead, profit, home office expenses and general supervision for the portion of work performed by the subcontractor.
11. The subcontractor must comply with all the requirements of the Contract for his portion of extra work and be compensated as permitted within this Section for the extra work.
12. No additional compensation will be paid for overhead, profit, home office expenses or supervision to any subcontractors working for subcontractors.

1.21 WARRANTY OF CONSTRUCTION

- A. For a period of one year, except as provided below, from the date of Final Acceptance, the Contractor warrants that the Work conforms to the Contract requirements and the RPQ requirements and is free of any patent and/or latent defect of the material or workmanship.

1. Exception to the above year warranty:

- a. Where the manufacturer of material provides a warranty in excess of one (1) year, the Contractor shall provide an assignment of warranty to the County with the manufacturer's written authorization. Contractors shall be obligated to provide to the County copies of all manufacturer's warranties and guarantees. Where the County specifies in an RPQ a warranty greater than one (1) year, such warranty will only be for the specified RPQ.
- b. The warranty hereunder shall be in addition to whatever rights the County may have under law. The Contractor's obligation under this warranty shall be at its own cost and expense, to promptly repair or replace (including cost of removal and installation), that item (or part of component thereof) which proves defective or fails to comply with the Contract within the warranty period such that it complies with the Contract.
- c. In the event the Contractor fails to repair or replace defective Work in accordance with the terms of the Contract, the RPQ, and this warranty, the County shall have the right to collect such costs incurred or withhold the cost of the anticipated repairs by offsetting the amount against any payment due the Contractor under any contract between the County and the Contractor.
- d. The warranty covering defective Work shall be reinstated for a period of one (1) year effective as of the date when the defect is remedied. If the defect is found to have a significant effect on any other part, component or item, the reinstatement of the warranty shall then be extended to cover the part component, or item so affected as well, and shall start as of the date the interrelated parts, components and items function properly. The warranty reinstatement provided for in this paragraph shall apply only to the first replacement or repair of any such item, part and component and, in the case of a failure which has a significant effect on another part, component or item, to the first extension of the said warranty to such affected items, parts and components.
- e. As specified in the construction documents. All guarantees and warranties under the Contract are fully enforceable by the County acting in its own name.

APPENDIX A OF THE SUPPLEMENTARY CONDITIONS
NOTICE OF CONSTRUCTION CLEARING HOUSE FORMS A, B AND C



MIAMI-DADE COUNTY – DEPARTMENT OF SMALL BUSINESS DEVELOPMENT

Job Clearinghouse (JCH)

CONSTRUCTION CLEARINGHOUSE JOB APPLICATION

Governed by Miami-Dade County Code section 2-1701 and R-1395-05

Section 1. To be completed by Job Applicant. Please print clearly or type

Title of position sought			Contract/Project Number (if applicable)		
Name: Last First Middle Initial			Last 4 digits of Social Security #		
Address (Street Name and Number) Apt.			Home telephone number:		
City State Zip Code			Additional Contact Telephone number:		
How long have you resided at the above address: ☐ less than 12 months ☐ 1 -5 years ☐ 6-10 yrs ☐ more than 10yrs			Address (Street Name and Number) Apt.____ City_____ State _____ Zip Code_____		
Date of Birth____/____/____ ☐ Male ☐ Female			Languages spoken ☐ English ☐ Spanish ☐ Creole ☐ Other _____		
			Languages you are able to read and clearly understand: ☐ English ☐ Spanish ☐ Creole ☐ Other _____		
Current Driver's license: ☐ None ☐ Operator/Class E ☐ Commercial/Class ____ ☐ Chauffeur/Class D					

Have you ever been employed in the construction industry? ☐ Yes ☐ No If yes, indicate the trade and the years of experience in each trade.

☐ General Laborer ____ months/years of experience	☐ Carpentry ____ months/years of experience	☐ Electrical ____ months/years of experience
☐ Mechanical ____ months/years of experience	☐ Plumbing ____ months/years of experience	☐ Site & Prep Work ____ months/years of experience
☐ Equipment Operator ____ months/years of experience	☐ Painting ____ months/years of experience	☐ Sprinkler fitting ____ months/years of experience
☐ Drywall Finishing ____ months/years of experience	☐ Masonry ____ months/years of experience	☐ Tile layer ____ months/years of experience
☐ Landscaping ____ months/years of experience	☐ Pipe Fitting ____ months/years of experience	☐ Truck Driver ____ months/years of experience
☐ Roofing ____ months/years of experience	☐ _____ ____ months/years of experience	

What hours are you available to work? ☐ 6am-2pm ☐ 7am-3pm ☐ 8am- 4pm ☐ Any shift ☐ Other _____

What construction trades are you interested in? ☐ Same as indicated above ☐ Other _____

Applicant's signature _____	Date _____

Section 2 *****FOR SBD USE ONLY*****

Certificates/Licenses: _____
Job References: _____

Title of Position Hired:	Date of Hire:
Duration of Job:	Job Salary (hourly rate):
Employer/Contractor	Contract/Project Number:
Applicant was recruited through: ☐ Self Recruit ☐ WDO ☐ WRO ☐ WTP	

Submit this application to: Attention: Job Clearinghouse Miami-Dade County, Department of Small Business Development (SBD) Project Review and Analysis Division 111 NW 1 st Street, 19 th floor Miami, Florida 33128 Telephone: (305) 375-3111 Fax (305) 375-3160



MIAMI-DADE COUNTY
DEPARTMENT OF SMALL BUSINESS DEVELOPMENT
Job Clearinghouse (JCH)

NOTICE OF CONSTRUCTION CLEARINGHOUSE JOB OPPORTUNITY

Governed by Miami-Dade County Code section 2-1701 and R-1395-05

To be completed by Employer/Contractor. Please print clearly or type

EMPLOYER/CONTRACTOR INFORMATION		
Business Name:		Contract/Project Number
Address (Street Name and Number)		Federal ID#
City	State	Zip Code
Telephone Number		Fax Number
Contact Person		Email Address
JOB LISTING INFORMATION		
Job Title		Application Deadline
Job Site Location		Number of Openings
Describe Job Duties:		Hourly Rate
Specialized Training:		
Experience Required (Months/Years):		
Specialized machinery or equipment:		
Job Duration: ☐ Permanent ☐ Temporary/If Temporary, how long? ____ Fringe Benefits? ☐ Yes ☐ No		
Education Required: ☐ None ☐ H.S Diploma/GED ☐ AA Degree ☐ Bachelor's Degree ☐ Master's Degree		
Certifications/License Required: ☐ None ☐ Yes If Yes, please list _____		
Driver's license required: ☐ None ☐ Operator/Class E ☐ Commercial/Class ____ ☐ Chauffeur/Class D		
Language(s) required: ☐ English ☐ Spanish ☐ Creole ☐ Other		
<u>APPLICANTS SHOULD CONTACT EMPLOYER BY:</u>		
☐ Call for Appointment ☐ Phone Interview ☐ Send Resume via: ☐ Mail ☐ Fax ☐ Email		
☐ Apply In Person Day of the Week: _____ Time: _____ Application Deadline: _____		

Employer/Contractor must submit this form for all job openings.

Attention: Job Clearinghouse
Miami-Dade County Department of Small Business Development
Project Review and Analysis Division
111 NW 1st Street, 19th floor
Miami, Florida 33128
Telephone: (305) 375-3111 Fax (305) 375-3160



Delivering Excellence Every Day

JOB CLEARINGHOUSE AFFIDAVIT
Notice of Construction Job Opportunities

Project / Contract Number: _____

Pursuant to Miami-Dade County Resolution No. R-1395-05, there are ____ open position(s) to submit to the Job Clearinghouse for this project at this time. All open positions will be submitted to South Florida Workforce at <https://iapps.careersourcesfl.com/jchcwp/>.

(Signature of Affiant)

(Date)

(Printed Name of Affiant, Title, and Firm Name)

(Witness)

Sworn to and subscribed before me this

_____ day of _____ 20 ____

By: _____

Signature of Notary Public



Personally Known



Produced ID

Type of ID produced _____

SECTION 6: SPECIFICATIONS

GENERAL REQUIREMENTS

DTPW DIVISION 1

DTPW SPECIFICATIONS
GENERAL REQUIREMENTS
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1. GENERAL REQUIREMENTS

1.01 DEFINITIONS AND TERMINOLOGY

A. General

1. These Specifications are written to the bidders, prior to award of the Contract, and to Contractor.
2. Where sentences directing work or other action appear in the active voice-imperative mood, without a subject, the subject "bidder" or "Contractor" is understood. In any other case where the subject is not clearly understood, Engineer will make a clarification and final determination as to the subject of the action.

B. Governing Regulations and Standard References

1. The following Standards and Governing Regulations, as amended by the Contract Documents, are hereby incorporated by reference:
 - a. Building Code as set forth in Chapter 8 of the Code of Miami-Dade County.
 - b. Public Works Manual of Metropolitan Dade County (Public Works Manual).
 - c. United States Department of Justice's 2010 ADA Standards For Accessible Design
 - d. Miami-Dade County's Traffic Control Equipment Specifications and Standards for The Metro Traffic Control System Miami-Dade County (TCESS).
 - e. Florida Department of Transportation's Standard Plans for Road and Bridge Construction (FDOT Standard Plans).
<http://www.fdot.gov/design/standardplans/SPRB/C.shtm>
 - f. Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications
<http://www.fdot.gov/programmanagement/Implemented/SpecBooks/default.shtm>
 - g. Florida Department of Transportation Surveying and Mapping Procedure
<http://fdotwp1.dot.state.fl.us/ProceduresInformation/ManagementSystemInternet/FormsAndProcedures/ViewDocument?topicNum=550-030-101>
 - h. Florida Department of Transportation Drainage Manual
<http://www.fdot.gov/roadway/Drainage/Manualsandhandbooks.shtm>
 - i. Florida Department of Transportation Soils and Foundations Handbook
<http://www.fdot.gov/structures/DocsandPubs.shtm>
 - j. Florida Department of Transportation Structures Manual

<http://www.fdot.gov/structures/DocsandPubs.shtm>

- k. Florida Department of Transportation Current Structures Design Bulletins

<http://www.fdot.gov/structures/Memos/currentbulletins.shtm>

- l. Manual on Uniform Traffic Control Devices (MUTCD)

<https://mutcd.fhwa.dot.gov/>

- m. Safe Mobility For Life Program Policy Statement

<http://www.fdot.gov/traffic/TrafficServices/SafetyisGolden.shtm>

- n. Florida Department of Transportation American with Disabilities Act (ADA) Compliance

<http://www.fdot.gov/roadway/ada/>

- o. Florida Department of Transportation Florida Sampling and Testing Methods

<http://www.fdot.gov/materials/administration/resources/library/publications/fstmdisclaimer.shtm>

- p. Florida Department of Transportation Flexible Pavement Coring and Evaluation Procedure

<http://www.fdot.gov/materials/administration/resources/library/publications/materialsmanual/documents/v1-section32-clean.pdf>

- q. Florida Department of Transportation Design Bulletins and Update Memos

<http://www.fdot.gov/roadway/Bulletin/>

- r. Florida Department of Transportation Utility Accommodation Manual

<http://www.fdot.gov/programmanagement/utilities/default.shtm>

- s. Florida Department of Transportation Flexible Pavement Design Manual

<http://www.fdot.gov/roadway/pm/pcs/flexiblepavementmanual.pdf>

- t. Florida Department of Transportation Rigid Pavement Design Manual

<http://www.fdot.gov/roadway/pm/pcs/rigidpavementmanual.pdf>

- u. Florida Department of Transportation Pavement Type Selection Manual

<http://www.fdot.gov/roadway/pm/Publications/PTSM.pdf>

- v. Florida Department of Transportation Traffic Engineering Manual

<http://www.fdot.gov/traffic/traffic services/Studies/TEM/TEM.shtm>

- w. Florida Department of Transportation Bicycle and Pedestrian Policies and Standards

<http://www.fdot.gov/roadway/bikeped/default.shtm>

- x. Federal Highway Administration Hydraulic Engineering Circular Number 18 (HEC 18).

https://www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm

- y. Florida Department of Transportation Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)

<http://www.fdot.gov/roadway/floridagreenbook/fgb.shtm>

- z. Florida Department of Transportation Project Development and Environment Manual, Parts 1 and 2
<http://www.fdot.gov/environment/pubs/pdeman/pdeman1.shtm>

- aa. Florida Department of Transportation Contract Compliance Manual.
<https://www.fdot.gov/equalopportunity/contractcompliancemanual.shtm>

- bb. Florida Department of Transportation Equal Opportunity Compliance (EOC) System.
<https://www.fdot.gov/equalopportunity/eoc.shtm>

- cc. Florida Statutes
<http://www.leg.state.fl.us/statutes/>

- dd. Miami-Dade County and Local Municipal Ordinances, unless otherwise is prohibited, by State or Federal regulations.

2. The above list is not all inclusive and it is the responsibility of Contractor to comply with all applicable requirements whether included in this list or not. Additional project-specific criteria are provided throughout the Contract Documents
3. The above referenced Standards are intended to supplement, not supersede the requirements set forth herein and, unless otherwise noted, the latest revision shall apply. Where differences occur between referenced Standards and these Contract Documents, the more stringent shall apply unless otherwise noted in the Contract Documents or directed by Engineer in writing.
4. FDOT Standard Specifications.
 - a. FDOT Standard Specifications for Road and Bridge Construction (Divisions II & III), as amended by the Contract Documents, apply to an Article within these Specifications when:
 - 1) The applicable FDOT Standard Specification Section (e.g. FDOT SECTION 415) is referenced in the title of the Article; or
 - 2) The FDOT Standard Specification section, article, or subarticle is referenced within the Article (e.g. FDOT Section 415, FDOT 415-3; FDOT 415-5.1, etc.)
 - b. Unless otherwise specified, where page numbers are used in these Specifications to reference modifications to the FDOT Standard Specifications, it shall be understood to reference the 2007 edition.

C. Abbreviations

The following abbreviations, when used in the Contract Documents, represent the full text shown.

AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	The Associated General Contractors of America, Inc.
AGMA	American Gear Manufacturers Association
AIA	American Institute of Architects.
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute, Inc.
APL	FDOT Approved Product List
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATSSA	American Traffic Safety Services Association
AWG	American Wire Gauge
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcing Steel Institute
DOL	U.S. Department of Labor
EASA	Electrical Apparatus Service Association
EPA	Environmental Protection Agency of the United States Government
F.A.C.	Florida Administrative Code
FBC	Florida Building Code
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FM	Florida Method or Florida Sampling and Testing Method
F.S.	Florida Statutes
FSS	Federal Specifications and Standards
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
IPCEA	Insulated Power Cable Engineers Association
ISO	International Organization for Standards
MDC	Miami-Dade County
MSTCSD	Minimum Specifications for Traffic Control Signals and Devices
NAM	Negotiated Acceptance Memorandum
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NIST	National Institute for Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NSF	NSF International

OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
DTPW	Miami-Dade County Department of Transportation and Public Works
SAE	Society of Automotive Engineers
SBE-CONST	Small Business Enterprise-Construction
SI	International System of Units
SSPC	Society of Protective Coatings
TSSQPL	Traffic Signals and Signs Qualified Products List
UL	Underwriters' Laboratories
U.S.C.	United States Code

D. Definitions

The following terms, when used in the Specifications, have the meaning described.

1. Article. The numbered prime subdivision of a Division of these Specifications.
2. Bracing. A temporary structural member(s) placed between beams, girders, piles columns, etc. to provide stability during construction activities.
3. Bridge. A structure, including supports, erected over a depression or over an obstruction such as water, highway or railway, or for elevated roadway, for carrying traffic or other moving loads, and having a length, measured along the center of the roadway, of more than 20 feet between the inside faces of end supports. A multiple-span box culvert is considered a bridge, where the length between the extreme ends of the openings exceeds 20 feet.
4. Calendar day. Every day shown on the calendar, ending and beginning at midnight. Unless otherwise stipulated in the Contract Documents, the term "days" shall be understood as calendar days. In computing any period of time prescribed or allowed by this Contract, the day of the act, event, or default from which the designated period of time begins to run shall not be included. The last day of the period so computed shall be included unless it is a Saturday, Sunday, or legal holiday, in which event the period shall run until the end of the next day which is neither a Saturday, Sunday, or legal holiday. When the period of time prescribed or allowed is less than 7 days, intermediate Saturdays, Sundays, and legal holidays shall be excluded in the computation.
5. Construction Affecting Public Safety. Construction that may jeopardize public safety such as structures spanning functioning vehicular roadways, pedestrian walkways, railroads, navigation channels of navigable waterways and walls or other structure foundations located in embankments immediately adjacent to functioning roadways. It does not apply to those areas of the site under Contractor's control and outside the limits of normal public access.
6. Contract. The term "Contract" means the entire and integrated agreement between the parties thereunder and supersedes all prior negotiations, representations, or agreements, either written or oral. The executed Contract Documents form the Contract between the Department (on behalf of the County) and Contractor setting forth the obligations of the parties thereunder, including, but not limited to, the performance of the Work and the basis of payment.
7. Contract Documents. Consists of those items so designated in and inclusive of the executed Contract. Only printed or hard copies of the items listed in the executed Contract Form are Contract Documents.
8. Contract Time. The maximum number of calendar days, including authorized time extensions, allowed for final completion of all Contract work and requirements. Also called Contract Duration.
9. Contract Unit Price. Refers to the Unit Price provided by the Contract that is fixed at time of Contract award.
10. Contractor. The individual, firm, joint venture, or company contracting with the County to perform the Work pursuant to the Contract.
11. Contractor's Engineer of Record.
 - a. A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing of components of the permanent structure as part of a redesign, or for repair designs and details of the permanent work. Contractor's Engineer of Record may also serve as the Specialty Engineer.
 - b. Contractor's Engineer of Record must be an employee of a pre-qualified firm. The firm shall be pre-qualified in accordance with the Rule 14-75, F.A.C. Any Corporation or Partnership offering engineering services must hold a Certificate of Authorization from the Florida Board of Professional Engineers.
 - c. As an alternate to being an employee of a pre-qualified firm, Contractor's Engineer of Record may be a pre-qualified Specialty Engineer. For items of the permanent Work declared by the FDOT Construction Office to be "major" or "structural", the work performed by a pre-qualified Specialty Engineer must be checked by another pre-qualified Specialty Engineer. An individual Engineer may become pre-qualified in the work groups listed in Rule 14-75, F.A.C., if the requirements for the Professional Engineer are met for the individual work groups. Pre-qualified Specialty Engineers are listed on the FDOT Construction Office website. Pre-qualified Specialty Engineers will not be authorized to perform redesigns of items fully detailed in the Plans.
12. Contractor Originated Designs. Items which the Contract Documents require Contractor to design, detail and incorporate into the permanent works.
13. Controlling Work Items. The activity or work item on the critical path having the least amount of total float. The controlling item of work will also be referred to as a Critical Activity.
14. County. Miami-Dade County, Florida.

15. Culverts. Any structure not classified as a bridge that provides an opening under the roadway.
16. Department. Miami-Dade County Department of Transportation and Public Works.
17. Engineer. The County Engineer, acting directly or through duly authorized representatives; such representatives acting within the scope of the duties and authority assigned to them.
 - a. Note: In order to avoid cumbersome and confusing repetition of expressions in these Specifications, it is provided that whenever anything is, or is to be done, if, as, or, when, or where "acceptable, accepted, approval, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designated, determined, directed, disapproved, established, given, indicated, insufficient, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, or unsatisfactory," it shall be understood as if the expression were followed by the words "by Engineer," "by the Engineer," "to the Engineer," or "of the Engineer."
18. Engineer of Record. The Professional Engineer or Engineering Firm registered in the State of Florida that develops the criteria and concept for the project, performs the analysis, and is responsible for the preparation of the Plans and Specifications. The Engineer of Record may be Departmental in-house staff, or a consultant retained by the Department. Contractor shall not employ the Engineer of Record as Contractor's Engineer of Record or as a Specialty Engineer.
19. Equipment. The machinery and equipment, together with the necessary supplies for upkeep and maintenance thereof, and all other tools and apparatus necessary for the construction and acceptable completion of the work.
20. Extra Work. Any "work" which is required by Engineer to be performed and which is not otherwise covered or included in the project by the existing Contract Documents, whether it be in the nature of additional work, altered work, deleted work, work due to differing site conditions, or otherwise. This term does not include a "delay".
21. Falsework. Includes any temporary construction work used to support the permanent structure until it becomes self-supporting. Falsework includes steel or timber beams, girders, columns, piles and foundations, and any proprietary equipment including modular shoring frames, post shores, and adjustable horizontal shoring.
22. Formwork. Includes any structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Formwork comprises common materials such as wood or metal sheets, battens, soldiers and walers, ties, proprietary forming systems such as stay-in-place metal forms, and proprietary supporting bolts, hangers and brackets. Formwork may be either permanent formwork requiring a shop drawing submittal such as stay-in-place metal or concrete forms, or may be temporary formwork which requires certification by the Specialty Engineer for Construction Affecting Public Safety and for Major and Unusual Structures.
23. Highway, Street, or Road. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.
24. Holidays. Days designated by Miami-Dade County as holidays, which include, but are not limited to, New Year's Day, Martin Luther King's Birthday, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and the following Friday, and Christmas Day.
25. Inspector. An authorized representative of the Engineer, assigned to make official inspections of the materials furnished and of the work performed by Contractor.
26. Laboratory. The official testing laboratory authorized by the Department.
27. Major and Unusual Structures: Bridges of complex geometry and/or complex design. Generally, this includes the following types of structures:
 - a. Bridges with an individual span longer than 300 feet.
 - b. Structurally continuous superstructures with spans over 150 feet.
 - c. Steel box and plate girder bridges.
 - d. Steel truss bridges.
 - e. Concrete segmental and longitudinally post-tensioned continuous girder bridges.
 - f. Cable stayed or suspension bridges.
 - g. Arch bridges.
 - h. Tunnels.
 - i. Movable bridges (specifically electrical and mechanical components).
 - j. Rehabilitation, widening, or lengthening of any of the above.
28. Major Item of Work. Any item of work having an original Contract value in excess of 5% of the original Contract amount.
29. Materials. Any substances to be incorporated in the work under the Contract.
30. Median. The portion of a divided highway or street separating the traveled ways for traffic moving in opposite directions.
31. Permanent Works. All the permanent structures and parts thereof required of the completed Contract.
32. Plans. The part of the Contract Documents prepared or approved by the Engineer, including reproductions thereof, which graphically shows or supplements the scope, extent, and character of the Work to be performed by Contractor. Whenever the word "Plans" appears in these Contract Documents, it shall include any related drawings or standard details referenced by the Contract Documents.

33. Right-of-Way. The land that the Department has title to, or right of use, for the road and its structures and appurtenances, and for material pits furnished by the Department.
34. Roadbed. The portion of the roadway occupied by the subgrade and shoulders.
35. Roadway. The portion of a highway within the limits of construction.
36. Scaffolding. An elevated work platform used to support workmen, materials and equipment, but not intended to support the structure.
37. Section. A numbered prime division of these Specifications.
38. Shop Drawings. All working, shop and erection drawings, associated trade literature, calculations, schedules, manuals and similar documents submitted by Contractor to define some portion of the Work. The Work may include both permanent and temporary works as appropriate to the Project. Shop Drawings and other contractor submittals are not Plans as so defined.
39. Shoring. A component of falsework such as horizontal, vertical or inclined support members. In this Section, this term is interchangeable with falsework.
40. Special Erection Equipment. Includes launching gantries, beam and winch equipment, form travelers, stability towers, strong-backs, erection trusses, launching noses or similar items made purposely for construction of the structure. It does not apply to commonly available proprietary construction equipment such as cranes.
41. Special Provisions. Project specific clauses adopted by the Department that add to or revise these Specifications and associated supplemental specifications, or provide other requirements applicable to the Contract.
42. Specialty Engineer.
 - a. A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing preparation of components, systems, or installation methods and equipment for specific temporary portions of the Work or for special items of the permanent works not fully detailed in the plans and required to be furnished by Contractor such as but not limited to pot bearing designs, non-standard expansion joints, mechanically stabilized earth wall designs and other specialty items. The Specialty Engineer may also provide designs and details for items of the permanent work declared by the FDOT Construction Office to be "minor" or "non-structural". The Specialty Engineer may be an employee or officer of Contractor or a fabricator, an employee or officer of an entity providing components to a fabricator, or an independent consultant.
 - b. For items of work not specifically covered by Rule 14-75, F.A.C., a Specialty Engineer is qualified if he has the following qualifications:
 - 1) Registration as a Professional Engineer in the State of Florida.
 - 2) The education and experience necessary to perform the submitted design as required by the Florida Board of Professional Engineers.
43. Specifications. The directions, provisions, and requirements contained herein, together with all stipulations contained in the Contract Documents, setting out or relating to the method and manner of performing the work, or to the quantities and qualities of materials and labor to be furnished under the Contract.
44. State. State of Florida.
45. Structure. Any waterworks, drainage works, sewage works, river works, earthworks or constructions of any kind, including those of earth or rock, permanent or temporary, and including bridges, dam, wall, caisson, mast, tower, pylon, underground tank, earth retaining elements or assembly of elements, formwork, falsework, scaffold, fences, poles, buildings, pavings, inlets, levees, tide gates, spillways, drop structures, any structure similar to the foregoing, and any other form of building, construction, arrangement of parts, elements, or materials found in structures.
46. Subarticle. A prime subdivision of an Article of these Specifications.
47. Subgrade. The portion of the roadbed immediately below the base course or pavement, including below the curb and gutter, valley gutter, shoulder and driveway pavement. The subgrade limits ordinarily include those portions of the roadbed shown in the plans to be constructed to a design bearing value or to be otherwise specially treated. Where no limits are shown in the plans, the subgrade section extends to a depth of 12 inches below the bottom of the base or pavement and outward to 6 inches beyond the base, pavement, or curb and gutter.
48. Substantial Completion. The time and date at which the Work has progressed to the point where, in the opinion of Engineer, the Work is sufficiently complete, in accordance with the Contract Documents, so that the Work can be occupied and/or utilized for the purposes for which it is intended. Substantial Completion must occur before the Project is issued a Certificate of Occupancy (or Completion, if applicable) by the Department that allows the County to utilize the entire Project for the purposes for which it is intended. Substantial completion on roadway projects includes completion and operation of traffic signals, street lighting and completion of landscape items.
49. Substructure. All of that part of a bridge structure below the bridge seats, including the parapets, backwalls, and wingwalls of abutments.
50. Superintendent. Contractor's authorized representative in responsible charge of the work.

51. Superstructure. The entire bridge structure above the substructure, including anchorage and anchor bolts, but excluding the parapets, backwalls, and wingwalls of abutments.
52. Surety. The corporate body that is bound by the Contract Bond with and for Contractor and responsible for the performance of the Contract and for payment of all legal debts pertaining thereto.
53. Temporary Works. Any temporary construction work necessary for the construction of the permanent works. This includes but is not limited to bracing, falsework, formwork, scaffolding, shoring, temporary earthworks, sheeting, cofferdams, and special erection equipment.
54. Traveled Way. The portion of the roadway providing for the movement of vehicles, exclusive of shoulders and auxiliary lanes.
55. Traffic Control Signals and Devices. Any signal or device, manually, electrically or mechanically operated, by which traffic is alternately directed to stop and permitted to proceed or controlled in any manner. Traffic control signals and devices regulate, warn, or guide traffic on, over or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction. Traffic control signals and devices include, but are not limited to, controller assemblies (controller cabinets and their contents); signal heads including their hanging or mounting devices; vehicle detection systems (loops, sealant, amplifier, lead-in wire, or cable); pedestrian detection systems (push button, push button housing, lead-in wires, and signal); motorist information systems, video equipment, network devices, dynamic message signs, highway advisory radios, cameras, vehicle detection systems, and other equipment used within a traffic control system.
56. Underground Facilities. All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
57. Work. All labor, materials and incidentals required to execute and complete the requirements of the Contract including superintendence, use of equipment and tools, and all services and responsibilities prescribed or implied.
58. Working Day. Any calendar day on which Contractor works or is expected to work in accordance with the approved work progress schedule.

construction and completion in every detail of the Work described therein.

2. The intent of the Contract is for Contractor to provide, at no additional cost to the County, all labor, documentation, services, materials, equipment, tools, transportation, and supplies that are:
 - a. Necessary to complete the Work in accordance with the Contract Documents.
 - b. Reasonably inferred and incidental to the Work, whether or not specifically called for by the Contract Documents.

B. Alteration of Plans or of Character of Work

1. Engineer reserves the right to make, at any time prior to or during the progress of the Work, such increases or decreases in quantities, whether a significant change or not, and such alterations in the details of construction, whether a substantial change or not, including but not limited to alterations in the grade or alignment of the road or structure or both, as may be found necessary or desirable by the Engineer. The term "significant change" applies only when the Engineer determines that the character of the work, as altered, differs materially from that involved or included in the original proposed construction.
2. Such increases, decreases or alterations shall not constitute a breach of Contract, shall not invalidate the Contract, nor release the Surety from any liability arising out of this Contract or the Surety bond. Contractor agrees to perform the work, as altered, the same as if it had been a part of the original Work.
3. The Department may require work that is not covered by a price in the Contract if the Department determines that such work does not constitute a significant change and is essential to the satisfactory completion of the Contract within its intended scope. If an adjustment in price is warranted, Engineer will determine the basis of payment for such an adjustment in a fair and equitable amount and authorize the adjustment through an executed Negotiated Acceptance Memorandum (NAM) provided by the Department.
4. In the instance of an alleged significant change, Engineer will review all pertinent information provided by Contractor to determine the validity of the allegation. The determination by Engineer shall be conclusive and shall not be subject to challenge by Contractor in any forum, except upon Contractor establishing by clear and convincing proof that the determination by Engineer was without any reasonable and good-faith basis.

C. Connections to Existing Pavement, Drives and Walks

1. Adhere to the limits of construction at the beginning and end of the Project as detailed in the Contract Documents. However, if Engineer determines that it is necessary to extend the construction in order to make suitable connections to existing pavement, Engineer will authorize such a change.

1.02 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Intent of Contract and Contract Documents

1. The intent of the Contract and Contract Documents is to describe a functionally complete project (or part thereof) to be constructed, and to provide for the

2. For necessary connections to existing pavement, walks and drives that are not indicated on the Plans, Engineer will provide direction regarding the proper connections in accordance with the applicable Standards.

D. Differing Site Conditions

1. During the progress of the Work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract Documents, or if unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract are encountered at the site, the party (County or Contractor) discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before Contractor disturbs the conditions or performs the affected work.
2. Upon receipt of written notification of differing site conditions from Contractor, Engineer will investigate the conditions. If Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly. Engineer will notify Contractor whether or not an adjustment of the Contract is warranted.
3. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to the County with respect to Contract Price and Contract Times by the submission of a Bid; or
 - b. The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making a Bid; or
 - c. Contractor failed to give the written notice as required by this Article.
4. Engineer will not allow a Contract adjustment for a differing site condition unless Contractor has provided the required written notice.
5. Engineer will not allow a Contract adjustment under this clause for any effects caused to any other Department or non-Department projects on which Contractor may be working.

E. Underground Facilities.

1. It is generally recognized, and Contractor should anticipate that information provided by utility owners during project design, frequently fails to disclose all

Underground Facilities. The fact that more utility lines or other Underground Facilities are located in the Project Site than shown on the Project Plans does not constitute an unforeseen or differing Site Condition and such undisclosed Underground Facilities do not differ materially from the conditions which Contractor should expect.

2. Any information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to the County design engineer by the owners of such Underground Utilities. Additional utilities may exist which are not shown in the Contract Documents. Unless it is otherwise expressly stated in the Special Provisions, the County is not responsible for the accuracy or completeness of any such information or data provided
3. Contractor is responsible for field verification and location of all Underground Facilities prior to the start of construction. No field work shall be allowed to start until Contractor has notified Sunshine State One-Call of Florida, Inc. and all affected utilities have been located. In addition, Contractor, without any additional compensation, must expose and physically locate all potentially conflicting Underground Facilities prior to construction and is fully responsible for:
 - a. Reviewing and checking all Underground Facilities information and data;
 - b. Locating and verifying all Underground Facilities at or contiguous to the Site;
 - c. Coordination of the Work with the owners of such Underground Facilities, including the County, during construction; and
 - d. The safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.
4. The actual locations of the Underground Facilities must be compared to locations shown on the Plans and any required changes in alignment and grade must be made at the time of construction in consultation with Engineer.
5. If an Underground Utilities is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents:
 - a. Identify the owner of such Underground Facilities and give written notice to that owner and to Engineer promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
 - b. Engineer will promptly review the Underground Facilities and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. If

Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of the Work, an adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly. Engineer will notify Contractor whether or not an adjustment of the Contract is warranted.

F. Contractor Proposed Changes Affecting Utilities

1. Contractor is responsible for identifying and assessing any potential impacts to a utility that may be caused by the changes proposed by Contractor, and Contractor must, at the time of making the request for a change, notify the Department in writing of any such potential impacts to utilities.
2. Department approval of a Contractor proposed change does not relieve Contractor of sole responsibility for all utility impacts, costs, delays or damages, whether direct or indirect, resulting from Contractor initiated changes in the design or construction activities from those in the original Contract Specifications, design plans (including traffic control plans) or other Contract Documents and which effect a change in utility work different from that shown in the utility plans, joint project agreements or utility relocation schedules.

G. Rights in and Use of Materials Found on the Site of the Work

1. Ownership and Disposal of Existing Materials: Unless otherwise directed by Engineer or elsewhere in the Contract Documents, take ownership and dispose of all materials that are not designated as the property of other parties, in both roadway and structures, found on the right-of-way, and all material in structures designated for removal. Such materials do not include earth or other excavated material required for the construction of the Project. During construction, Contractor may use materials from existing structures that are required to be removed and that are designated to remain the property of the Department. Do not cut or otherwise damage such material during removal unless Engineer gives permission to do so. Store material in an accessible location as Engineer directs. The Department is not responsible for the quality or quantity of any material salvaged.
2. Ornamental Trees and Shrubs: Take ownership of all ornamental trees or shrubs existing in the right-of-way that are required to be removed for the construction operations and which are not specifically designated on the Plans to be reset, relocated, or to be removed by others prior to the construction operations.

H. Restoration of Property

1. Take preconstruction videos/pictures of the entire work zone and adjacent areas.
2. Public or private property damaged during construction or removed for convenience of the Work

must be repaired or replaced at Contractor's expense in a manner acceptable to Engineer, prior to final acceptance of the Work or sooner if otherwise required by the Contract Documents or Engineer. This includes, but is, not limited to signalization equipment and miscellaneous hardware removed from the construction site, signs, driveways, landscaping, sidewalk, walkways, walls, fences, footings, underground utilities, etc.

3. Contractor must comply with the requirements of Miami-Dade County Code Section 2-103.1 (b), CONSTRUCTION OF PUBLIC UTILITIES OR WORKS IN PUBLIC RIGHTS-OF-WAY

- a. "Whenever any person, corporation, partnership, association, County Department or other legal entity performs any construction or public work within an existing right-of-way located within unincorporated Miami-Dade County, or in right-of-ways of roads or streets located within municipalities that are maintained by the County, the right-of-way, including sidewalks, curbs and gutters, landscaping and must be restored to their legally permissible preexisting condition, including any aesthetic enhancements thereto and any adjacent private property damaged during construction, within thirty (30) days of completion of the construction or public work in that right of way or within thirty (30) days of damage to the affected property or area, whichever occurs first. Prior to the time such construction work begins, the contractor, by posting the construction site, shall inform the local community of the requirement to restore the right-of-way as well as any affected adjacent private property and the fines that could be imposed for each failure to do so. All work to be done pursuant to this Section shall be performed in compliance with the Public Works Manual. Any entity failing to restore the right-of-way to its preexisting condition or better within the time permitted shall be subject to a civil fine of five hundred dollars (\$500.00) per violation per day until such time as the right-of-way is restored, as well as five hundred dollars (\$500.00) per day for each affected adjacent private property until it is restored." Contractor may obtain a complete copy of the Ordinance from the Clerk of the Board.
- b. Post the construction site pursuant to Miami-Dade County Code Section 2-103 (b). The Public Notice to be posted is to read as follows:

**PUBLIC NOTICE
ORDINANCE NO. 03-89**

Contractor shall restore the right-of-way as well as any affected adjacent private property within 30 days of completion of construction or damage to the affected property or area, whichever occurs first.

Any entity failing to restore the right-of-way to its pre-existing condition or better within the time promoted shall be subject to a civil fine of \$500 per violation per day.

4. Survey monuments.

- a. Upon completion of construction activities and prior to the expiration of the Contract:
 - 1) Coordinate the replacement of any monument(s) disturbed or destroyed.
 - 2) Submit to Engineer for review and approval, a survey report that includes all monuments replaced and all monuments impacted as a result of construction activities.
- b. The replacement of monuments and the preparation of the survey report must be by a licensed Florida Surveyor and Mapper and meet all applicable State Rules, Statutes, and requirements of the Department. All costs required for compliance with these requirements will be included among the Contract pay items.

5. Failure to Restore Damaged Property:

- a. In case of failure on the part of Contractor to restore such property, bridge, road or street, or to make good such damage or injury, Engineer may, upon 48 hours notice, proceed to repair, rebuild, or otherwise restore such property, road, or street as may be deemed necessary, and the Department will deduct the cost thereof from any monies due or which may become due Contractor under the Contract. Nothing in this clause prevents the Contractor from receiving proper compensation for the removal, damage, or replacement of any public or private property, not shown on the plans, that is made necessary by alteration of grade or alignment. Engineer will authorize such work, provided that Contractor, or his employees or agents, have not, through their own fault, damaged such property.

6. Work Site Clean-Up:

- a. Debris and trash shall be removed from the site daily. Mow turf or vegetation within the project limits in accordance with Article 107 of the Construction Specifications.

- b. Upon completion of all work specified herein at each work site and before acceptance and payment is made, Contractor shall remove from each work site all machinery, equipment, surplus and discarded materials, rubbish and temporary structures. Material cleared from site and deposited on adjacent property will not be considered as having been disposed of satisfactorily.

I. Final Cleaning Up of Right-of-Way

1. Upon completion of the Work, and before the Department accepts the Work and makes final payment, remove from the right-of-way and adjacent property all falsework, equipment, surplus and discarded materials, rubbish and temporary structures; restore in an acceptable manner all property, both public and private, that has been damaged during the prosecution of the work; and leave the waterways unobstructed and the roadway in a neat and presentable condition throughout the entire length of the work under Contract. Clean all areas impacted by the Work and remove sedimentation in drainage structures caused by the construction activities.
2. Do not dispose of materials of any character, rubbish or equipment, on abutting property, with or without the consent of the property owners. Engineer will allow Contractor to temporarily store equipment, surplus materials, usable forms, etc., on a well-kept site owned or leased by Contractor, adjacent to the Project. However, do not place or store discarded equipment, materials, or rubbish on such a site.
3. Shape, dress and restore areas adjacent to the Project right-of-way that were used as plant sites, materials storage areas or equipment yards when they are no longer needed for such purposes.

1.03 CONTROLLING WORK

A. Plans

1. Contract Documents: Have one complete copy of the Contract Documents available on the worksite at all times.
2. Department's Plans: Unless otherwise labeled, all Items shown on the Plans are considered to be part of the Work, and must be incorporated into the Work and included in the established prices.
3. Alterations in Plans: The Department will issue, in writing, all authorized alterations affecting the requirements and information given on the approved plans.

B. Typical Details and/or Sketches

1. Typical details and/or sketches regarding the proposed work may be provided in addition to the standard details that are available in the Miami-Dade County Public Works Manual and the latest edition of the Florida Department of Transportation's Design

Standards for Design, Construction, Maintenance and Utility Operations on The State Highway System.

2. County through its Engineer shall have the right to modify the details and/or sketches, to supplement the sketches with additional plans and/or with additional information as work proceeds; all of which shall be considered as plans accompanying these Specifications herein generally referred to as the "Plans." In case of disagreement between the Plans and Specifications, Engineer will make a final determination as to which will govern.

C. Or-Equals and Substitutes

1. Except where specifically provided, whenever material or equipment is specified or described in the Contract Documents by proprietary name or as being available from a particular supplier, the intent is to establish the type, function, appearance, and quality required. A written request to Engineer to authorize an "or-equal" or "substitute" material or equipment may be submitted as described below unless the item specified or described contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted.

a. Or-Equal Material or Equipment:

- 1) Material or equipment proposed by Contractor may be considered by Engineer as an "or equal" item if in Engineer's sole discretion the item proposed is functionally equal and sufficiently similar to that specified or described in the Contract Documents and that no change in related Work will be required.
- 2) Contractor has the burden of proving at Contractor's own cost and expense, to the satisfaction of Engineer, that the proposed item is equal to the named item. If Contractor fails to comply with the provisions of this Article, or if Engineer determines that the proposed item is not equal to that named, Contractor must supply the product named.
- 3) For the purposes of this Article and at Engineer's sole discretion, a proposed item of material or equipment will be considered functionally equal to the item specified or described in the Contract Documents if:
 - a) In the exercise of reasonable judgment Engineer determines that the proposed item is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics; will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; has a proven

record of performance and availability of responsive service; and

- b) Contractor certifies that, if approved and incorporated into the Work, there will be no increase in cost to the County or increase in Contract Times, and the proposed item will conform substantially to the detailed requirements of the item named in the Contract Documents.

b. Substitute Material or Equipment:

- 1) If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, it may be proposed for consideration as a substitute item by Contractor submitting sufficient information as stipulated below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to and an acceptable substitute for that named. Requirements pertaining to a proposed substitute item request for review by Engineer will be as set forth in this Article, as supplemented in the Contract Documents, and as Engineer may decide are appropriate under the circumstances.
- 2) Contractor must make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application shall:
 - a) Certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified;
 - b) State the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time; whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents to adapt the design to the proposed substitute item; and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - c) Identify all variations of the proposed substitute item from that specified, and available engineering, sales, maintenance, repair, and replacement services;

- d) Contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- 2. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. For Engineer approval, submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be as set forth in this Article, as supplemented in the Contract Documents, and as Engineer may decide are appropriate under the circumstances.
- 3. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to this Article and will be the sole judge of acceptability. Engineer may require Contractor to furnish additional data about the proposed substitute item. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by receipt from Engineer of either a written approval or Change order where required for a substitute; or an approved Shop Drawing or written approval for an "or equal." Engineer will advise Contractor in writing of any negative determination. Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense. County may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute item.
- 4. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to this Article whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse the County for the costs for evaluating each such proposed substitute. Contractor shall also reimburse the County for the costs of making changes in the Contract Documents from the acceptance of each proposed substitute.

D. Right Of Way Verification

- 1. All Work and improvements shall be performed, constructed and installed within the limits of the existing Right-of-Way pursuant to the Contract Documents.
- 2. Obtain all necessary documentation for verifying rights-of-way and property lines.
- 3. Retain a Florida Registered Surveyor and Mapper to obtain right-of-way and property lines by examining available rights-of-way maps, plats, occupation, legal descriptions or other legal documents or means. The

Surveyor will layout the required alignments and grades and be responsible for their accuracy.

- 4. All field notes on this Project must be kept in a dedicated field book. Submit all field books to Engineer once the Project is completed or prior to completion when a field book gets filled.
- 5. All costs for complying with these requirements are included under the several scheduled items of the overall Contract. Therefore, no separate payment will be made for this work.

E. Shop Drawings

1. Shop Drawings:

- a. General. Prepare and submit whatever detailed working drawings necessary to fabricate, erect, and construct all parts of the Work in conformity with the Plans and Specifications. Shop drawings shall be submitted to Engineer; two sets will be returned to Contractor approved or showing the changes or corrections required; if changes or corrections are required, four revised copies shall be resubmitted until they are approved. Payment for shop drawings and required documents, revisions thereof, and for all copies furnished, shall be included in the various items of work bid. Contractor should allow a minimum of 14 days for the County's approval of shop drawings. County is not responsible for errors or minor discrepancies of Contractor's drawings, even though approved.
- b. Work Items Requiring Shop Drawings: In general, the Department requires shop drawings for items of work not fully detailed in the plans which require additional drawings and coordination prior to constructing the item, including but not limited to:
 - 1) Bridge components not fully detailed in the plans
 - 2) Retaining Wall Systems
 - 3) Precast Box Culverts
 - 4) Non-standard lighting, signalization and signing structures and components
 - 5) Building structures
 - 6) Drainage structures, attenuators, and other nonstructural items
 - 7) Design and structural details furnished by Contractor in compliance with the Contract
 - 8) Temporary Works affecting public safety.
- c. Schedule of Submittals: Prepare and submit a schedule of submittals that identifies the work for which shop drawings apply. For each planned submittal, define the type, and approximate number of drawings or other

documents that are included and the planned submittal date, considering the processing requirements herein. Submit the schedule of submittals to Engineer at the preconstruction conference, and prior to the submission of any shop drawings. Coordinate subsequent submittals with construction schedules to allow sufficient time for review, approval, and re-submittal as necessary.

d. Style, Numbering, and Material of Submittals:

- 1) Drawings: Furnish four clearly legible copies of all shop drawings that are necessary to complete the structure in compliance with the design shown on the Plans. Prepare all shop drawings using the same units of measure as those used in the Plans. Use sheets no larger than 11 by 17 inches unless otherwise required by Engineer. Consecutively number each sheet in the submittal series, and indicate the total number in the series (i.e., 1 of 12, 2 of 12, . . . , 12 of 12). Include on each sheet the following items as a minimum requirement: the Project Number, Bridge Number(s), drawing title and number, a title block showing the names of the fabricator or producer and Contractor for which the work is being done, the initials of the person(s) responsible for the drawing, the date on which the drawing was prepared, the location of the item(s) within the Project, Contractor's approval stamp with date and initials, and, when applicable, the documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record, as appropriate. A re-submittal will be requested when any of the required information is not included.
- 2) Other Documents: Provide four sets of original documents or clearly legible copies of documents other than drawings, such as trade literature, catalogue information, calculations, and manuals. Provide sheets no larger than 11 by 17 inches unless otherwise required by Engineer. Clearly label and number each sheet in the submittal to indicate the total number of sheets in the series (i.e., 1 of 12, 2 of 12, . . . , 12 of 12). Additional sets of documentation may be required by Engineer for review of precast prestressed and structural steel components.
- 3) Prepare all documents using the same units of measure as those used in the Contract Documents. Bind and submit all documents with a Table of Contents cover sheet. List on the cover sheet the total number of pages and appendices, and include the Project Number, a title referencing the submittal item(s), the name of the firm and person(s)

responsible for the preparation of the document, Contractor's approval stamp with date and initials, and, when applicable, the documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record, as appropriate.

- 4) Submit appropriately prepared and checked calculations and manuals that clearly outline the design criteria. Include on the internal sheets the Project Number and the initials of the person(s) responsible for preparing and checking the document.
- 5) Clearly label trade literature and catalogue information on the front cover with the title, Project Number, date and name of the firm and person(s) responsible for that document.

e. Submittal Paths and Copies:

- 1) General: Submit shop drawings to Engineer or Engineer's duly authorized representative. At the preconstruction conference, the Department will notify Contractor of any changes in the submittal path and whether the Department's or the Consultant's review stamp will signify an officially reviewed shop drawing. When the Engineer of Record is a consultant hired by the Department, submit shop drawings to the consultant with a copy to Engineer. For work requiring other documentation (e.g., catalog data, procedure manuals, fabrication/welding procedures, and maintenance and operating manuals), submit the required number of copies with the prints. If not shown on the plans, the Department will furnish the mailing address of the Consulting Engineer of Record. Provide copies of material certifications and material tests to Engineer.
- 2) Contractor-Originated Design: Submit shop drawings and applicable calculations to the Engineer of Record for review. Ensure that each sheet of the shop drawings and the cover sheet of the calculations are signed and sealed by the Specialty Engineer or Contractor's Engineer of Record. Transmit the submittal and copies of the transmittal letters in accordance with the submittal requirements stipulated herein.
- 3) Temporary Works: For Construction Affecting Public Safety, submit to the Engineer of Record shop drawings and the applicable calculations for the design of special erection equipment, bracing, falsework, scaffolding, etc. Ensure that each sheet of the shop drawings and the

cover sheet of the applicable calculations is signed and sealed by the Specialty Engineer. Transmit the submittal and copies of the transmittal letters in accordance with the submittal requirements stipulated herein.

- 4) Formwork and Scaffolding: Contractor is solely responsible for the safe installation and use of all formwork and scaffolding. The Department does not require any formwork or scaffolding submittals unless such work would be classified as Construction Affecting Public Safety or called for by the Contract Documents.
 - 5) Beam and Girder Temporary Bracing: Contractor is solely responsible for ensuring stability of beams and girders during all handling, storage, shipping and erection. Adequately brace beams and girders to resist wind, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the products, considering actual beam geometry and support conditions during all stages of erection and deck construction. Develop the required designs following the AASHTO Guide Design Specifications for Bridge Temporary Works and Construction Handbook for Bridge Temporary Works and the Contract Documents.
 - 6) For Construction Affecting Public Safety, submit signed and sealed calculations for stability for all beams and girders.
 - 7) Erection Plan: Submit, for Engineer's review, an Erection Plan that meets the specific requirements of FDOT Sections 450, 452 and 460 and this section. Refer to FDOT Design Standards Index 600 for construction activities not permitted over traffic.
 - 8) Other Miscellaneous Design and Structural Details Furnished by Contractor in Compliance with the Contract: Submit to Engineer any shop drawings and applicable calculations. Ensure that each sheet of the shop drawings and the cover sheet of the applicable calculations is signed and sealed by the Specialty Engineer. Transmit the submittal and copies of the transmittal letters in accordance with the submittal requirements stipulated herein.
- f. Processing of Shop Drawings:
- 1) Contractor Responsibility for Accuracy and Coordination of Shop Drawings:
 - a) Coordinate, schedule, and control all submittals, with a regard for the required priority, including those of the various subcontractors, suppliers, and engineers, to provide for an orderly and balanced distribution of the work.
 - b) Submit shop drawings to facilitate expeditious review. Contractor is discouraged from transmitting voluminous submittals of shop drawings at one time. For submittals transmitted in this manner, allow for the additional review time that may result.
 - c) Only shop drawings distributed that have been approved by the Department are valid. Any work that Contractor performs in advance of approval will be at Contractor's risk.
- 2) Scope of Review by Engineer: The Engineer of Record's review of the shop drawings is for conformity to the requirements of the Contract Documents and to the intent of the design. The Engineer of Record's review of shop drawings which include means, methods, techniques, sequences, and construction procedures are limited to the effects on the permanent works. The Engineer of Record's review of submittals which include means, methods, techniques, sequences, and construction procedures does not include an in-depth check for the ability to perform the work in a safe or efficient manner. Review by the Engineer of Record does not relieve Contractor of responsibility for dimensional accuracy to ensure field fit and for conformity of the various components and details.
- 3) Special Review by Engineer of Shop Drawings for Construction Affecting Public Safety: For Construction Affecting Public Safety, the Engineer of Record, or other Engineer as the Department appoints for this purpose, will make an independent review of all relevant shop drawings and similar documents. Do not proceed with construction of the permanent works until receiving the Engineer of Record's approval. The review of these shop drawings is for overall structural adequacy of the item to support the imposed loads and does not include a check for economy, efficiency or ease of construction.
- g. Other Requirements for Shop Drawings for Bridges:
- 1) Shop Drawings for Structural Steel and Miscellaneous Metals: Furnish shop drawings for structural steel and miscellaneous metals. Shop drawings shall consist of working, shop, and erection drawings, welding procedures, and other working plans, showing

- details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.
- 2) Shop Drawings for Concrete Structures: Furnish shop drawings for concrete components that are not cast-in-place and are not otherwise exempted from submittal requirements. Also, furnish shop drawings for all details that are required for the effective prosecution of the concrete work and are not included in the Contract Documents such as: special erection equipment, masonry layout diagrams, and diagrams for bending reinforcing steel, in addition to any details required for concrete components for the permanent work.
 - 3) Shop Drawings for Major and Unusual Structures: In addition to any other requirements, within 60 days from the Notice to Proceed, submit information to Engineer outlining the integration of the Major and Unusual Structure into the overall approach to the project. Where applicable to the project, include, but do not limit this information to:
 - a) The overall construction program for the duration of the Contract. Clearly show the Milestone dates.
 - b) The overall construction sequence. The order in which individual structures are to be built, the sequence in which individual spans of girders or cantilevers are erected, and the sequence in which spans are to be made continuous.
 - c) The general location of any physical obstacles to construction that might impose restraints or otherwise affect the construction, and an outline of how to deal with such obstacles while building the structure(s).
 - d) The approximate location of any special lifting equipment in relation to the structure, including clearances required for the operation of the equipment.
 - e) The approximate location of any temporary falsework, and the conceptual outline of any special erection equipment. Provide the precise locations and details of attachments, fixing devices, loads, etc. in later detailed submittals.
 - f) An outline of the handling, transportation, and storage of fabricated components, such as girders or concrete segments. Provide the precise details in later detailed submittals.
 - g) Any other information pertinent to the proposed scheme or intended approach.
 - h) Clearly and concisely present the above information on as few drawings as possible in order to provide an overall, integrated summary of the intended approach to the project. The Department will use these drawings for information, review planning, and to assess Contractor's approach in relation to the intent of the original design. The delivery to and receipt by Engineer does not constitute any Department acceptance or approval of the proposals shown thereon. Include the details of such proposals on subsequent detailed shop drawing submittals. Submit timely revisions and re-submittals for all variations from these overall scheme proposals.
 - h. Cost of Shop Drawings: Include the cost of furnishing shop and working drawings in the Contract prices for the work requiring the shop and working drawings. The Department will not pay Contractor additional compensation for such drawings.
2. Certifications:
- a. Special Erection Equipment: Prior to its use, ensure that the Specialty Engineer personally inspects the special erection equipment and certifies to Engineer in writing that the equipment has been fabricated in accordance with the submitted drawings and calculations. In addition, after assembly, ensure that the Specialty Engineer observes the equipment in use and certifies to Engineer in writing that it is being used as intended and in accordance with the submitted drawings and calculations. In each case, ensure that the Specialty Engineer also signs and seals the letter of certification.
 - b. Falsework and Shoring Requiring Shop Drawings: After its erection or installation but prior to the application of any superimposed load, ensure that the Specialty Engineer personally inspects the falsework and certifies to Engineer in writing that the falsework has been constructed in accordance with the materials and details shown on the submitted drawings and calculations. Ensure that the Specialty Engineer also signs and seals the letter of certification.
 - c. Temporary Formwork: For Construction Affecting Public Safety and for Major and Unusual Structures, prior to the placement of any concrete, ensure that the Specialty Engineer inspects the formwork and certifies to Engineer in writing that the formwork has been constructed to safely withstand the

superimposed loads to which it will be subjected. Ensure that the Specialty Engineer signs and seals the letter of certification.

- d. Erection: For Construction Affecting Public Safety, submit an erection plan signed and sealed by the Specialty Engineer to Engineer at least four (4) weeks prior to erection commencing. Include as part of this submittal signed and sealed calculations and details for any falsework, bracing or other connection(s) supporting the structural elements shown in the erection plan.
- e. At least two (2) weeks prior to beginning erection, conduct a Preerection meeting with the Specialty Engineer and Engineer to review details of the plan.
- f. After erection of the elements but prior to opening of the roadway below the structure, ensure that a Specialty Engineer has personally inspected the erected member(s) and certified to Engineer that the structure has been erected in accordance with the signed and sealed erection plan.
- g. Perform daily inspections of the erected structural systems. For structures without temporary supports but with temporary girder bracing systems, perform inspections until all the diaphragms and cross frames are in place. For structures with temporary supports, perform inspections until the temporary supports are no longer needed as indicated in the erection plans. Provide written documentation of the inspections to Engineer within 24 hours of the inspection.

3. Corrections for Construction Errors:

- a. For work that Contractor constructs incorrectly or does not meet the requirements of the Contract Documents, Contractor has the prerogative to submit an acceptance proposal to Engineer for review and disposition. The acceptance proposal shall describe the error or defect and either describe remedial action for its correction or propose a method for its acceptance. In either case, the acceptance proposal shall address structural integrity, aesthetics, maintainability, and the effect on Contract Time. The Department will judge any such proposal for its effect on these criteria and also for its effect on Contract Administration.
- b. When Engineer judges that a proposal infringes on the structural integrity or maintainability of the structure, Contractor's Engineer of Record will perform a technical assessment and submit it to Engineer for approval.
- c. Do not take any corrective action without Engineer's approval. Carry out all approved corrective construction measures at no expense to the County.

- d. Notwithstanding any disposition of the compensation aspects of the defective work, Engineer's decision on the technical merits of a proposal is final.

F. Coordination of Contract Documents

1. These Specifications, the Plans, Special Provisions, and all supplementary documents are integral parts of the Contract; a requirement occurring in one is as binding as though occurring in all.
2. All parts of the Contract Documents are complementary and describe and provide for a complete work. In addition to the work and materials specified in the Specifications as being included in any specific pay item, include in such pay items additional, incidental work, not specifically mentioned, when so shown in the plans, or if indicated, or obvious and apparent, as being necessary for the proper completion of the work under such pay item and not stipulated as being covered under other pay items.
3. Promptly notify Engineer in writing of any conflict, error, ambiguity, omission or discrepancy which Contractor may discover within the Contract Documents and obtain a written interpretation or clarification from Engineer before proceeding with any work affected thereby. The higher quality, greater quantity, more specific or restrictive, or more expensive requirement necessary and applicable to the completed Project, based on Engineer's interpretation, will take precedence. Engineer's written decision on the issue will be final and binding.

G. Conformity of Work with Contract Documents

1. Perform all work and furnish all materials in conformity with the lines, grades, cross-sections, dimensions, and material requirements, including tolerances, as specified in the Contract Documents.
2. In the event that Engineer finds that Contractor has used material or produced a finished product that is not in conformity with the Contract Documents, but that Contractor has produced reasonably acceptable work, Engineer will determine if the Department will accept the work. In this event, Engineer will document the basis of acceptance by Contract modification, which provides for an appropriate reduction in the Contract price for such work or materials included in the accepted work as deemed necessary to conform to the determination based on engineering judgment.
3. In the event that Engineer finds that Contractor has used material or produced a finished product that is not in conformity with the Contract Documents, and that Contractor has produced an inferior or unsatisfactory product, Contractor shall remove and replace or otherwise correct the work or materials at no expense to the County.
4. For base and surface courses, the Department will allow the finished grade to vary as much as 0.1 foot from the grade shown in the plans, provided that Contractor's work meets all templates and

straightedge requirements and contains suitable transitions.

H. Errors or Omissions in Contract Documents

1. Do not take advantage of any apparent error or omission discovered in the Contract Documents, but immediately notify Engineer of such discovery. Engineer will then make such corrections and interpretations as necessary to reflect the actual spirit and intent of the Contract Documents.

I. Authority of Engineer

1. Perform all work to the satisfaction of Engineer. Engineer will decide all questions, difficulties, and disputes, of whatever nature, that may arise relative to the interpretation of the Plans, construction, prosecution, and fulfillment of the Contract, and as to the character, quality, amount, and value of any work done, and materials furnished, under or by reason of the Contract.

J. Authority and Duties of Engineer's Assistants

1. Engineer's assistants and representatives are authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the manufacture, preparation, or fabrication of the materials to be used. Such assistants and representatives are not authorized to revoke, alter, or waive any requirement of these Specifications. Rather, they are authorized to call to the attention of Contractor any failure of the work or materials to meet the Contract Documents, and have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by Engineer.
2. Engineer will immediately notify Contractor in writing of any such suspension of the work, stating in detail the reasons for the suspension. The presence of the inspector or other assistant in no way lessens the responsibility of Contractor.

K. Engineering and Layout

1. Control Points Furnished by the Department:

- a. Engineer will provide centerline control points (Begin Project, End Project, PIs, PTs, etc.) and bench marks at appropriate intervals along the line of the project to facilitate the proper layout of the work. Normally, Engineer will furnish only one bench mark for water crossings. Preserve all reference points and bench marks that the Department furnishes.
- b. As an exception to the above, for projects where the plans do not show a centerline or other survey control line for construction of the work (e.g. resurfacing, safety modifications, etc.) Engineer will provide only points marking the beginning and ending of the project, and all exceptions.

2. **Furnishing of Stake Materials:** Furnish all stakes, templates, and other materials necessary for establishing and maintaining the lines and grades necessary for control and construction of the Work.

3. Layout of Work:

- a. Utilizing the control points furnished by the Department, establish all horizontal and vertical controls necessary to construct the work in conformity to the Contract Documents. Perform all calculations required, and set all stakes needed such as grade stakes, offset stakes, reference point stakes, slope stakes, and other reference marks or points necessary to provide lines and grades for construction of all roadway, bridge, and miscellaneous items.
- b. When performing utility construction as part of the project, establish all horizontal and vertical controls necessary to carry out such work.

4. Specific Staking Requirements:

- a. When performing new base construction as part of the Project, set stakes to establish lines and grades for subgrade, base, curb, and related items at intervals along the line of the work no greater than 50 feet on tangents and 25 feet on curves. Set grade stakes at locations that Engineer directs to facilitate checking of subgrade, base, and pavement elevations in crossovers, intersections, and irregular shaped areas.
- b. For bridge construction stakes and other control, set references at sufficiently frequent intervals to ensure construction of all components of a structure in accordance with the lines and grades shown in the plans.
- c. For projects where the plans do not show a centerline or other survey control line for construction of the work (resurfacing, safety modifications, etc.), provide only such stakes as necessary for horizontal and vertical control of work items.
- d. For resurfacing and resurfacing-widening type projects, establish horizontal controls adequate to ensure that the asphalt mix added matches with the existing pavement. In tangent sections, set horizontal control points at 100 foot intervals by an instrument survey. In curve sections, set horizontal control points at 25 foot intervals by locating and referencing the centerline of the existing pavement.
- e. Establish by an instrument survey, and mark on the surface of the finished pavement at 25 foot intervals, the points necessary for striping of the finished roadway. As an exception, for resurfacing and resurfacing/widening projects, establish these points in the same manner as used for horizontal control of paving operations. Mark the pavement with white paint. If performing striping, Engineer may approve an alternate

method for layout of striping provided that Contractor achieves an alignment equal to or better than the alignment that would be achieved using an instrument survey.

- f. For projects that include temporary or permanent striping of "no passing zones", provide the location and length of these zones as shown in the plans, except projects where the vertical or horizontal alignment is new or altered from preconstruction alignment. For projects that consist of new or altered vertical or horizontal alignment, the Department will provide the location and length of the "no passing zones" during construction. For these projects, notify Engineer not less than 21 calendar days prior to beginning striping.
- g. For all projects, set a station identification stake at each right-of-way line at 100 foot intervals and at all locations where a change in right-of-way width occurs. Mark each of these stakes with painted numerals, of a size readable from the roadway, corresponding to the project station at which it is located. As an exception to the above, for projects where plans do not show right-of-way lines, set station identification stakes at locations and intervals appropriate to the type of work being done. For resurfacing and resurfacing/widening projects, set station identification stakes at 200 foot intervals.

5. Personnel, Equipment, and Record Requirements:

- a. Employ only competent personnel and use only suitable equipment in performing layout work. Do not engage the services of any person or persons, employed by the Department, for performance of layout work.
- b. Keep adequate field notes and records while performing layout work. Make these field notes and records available for Engineer's review as the work progresses, and furnish copies to Engineer at the time of completion of the project. Engineer's inspection, checking, or acceptance of Contractor's field notes or layout work does not relieve Contractor of his responsibility to achieve the lines, grades, and dimensions shown in the Contract Documents.
- c. Prior to final acceptance of the project, mark, in a permanent manner on the surface of the completed work, all horizontal control points originally furnished by the Department.

6. Payment: Include the cost of performing layout work as described above in the Contract unit prices for the various items of work that require layout.

L. Contractor's Supervision

1. Contractor's Superintendent:

- a. Maintain a competent superintendent at the Site at all times while work is in progress to

act as Contractor's agent. The superintendent must:

- 1) Be capable of properly interpreting the Contract Documents and thoroughly experienced in the type of work being performed.
- 2) Have full authority to receive instructions from Engineer and to execute the orders or directions of the Engineer, including promptly supplying any materials, tools, equipment, labor, and incidentals that may be required.
- 3) Speak and understand English.

- b. Maintain at least one other responsible person who speaks and understands English, on the Project during all working hours.
- c. Furnish sufficient superintendence and supervisory personnel commensurate to the amount and type of work being performed.

2. Supervision for Emergencies:

- a. Provide a responsible person, who speaks and understands English, and who is available at or reasonably near the worksite on a 24 hour basis, seven days a week. Designate this person as the point of contact for emergencies and in cases that require immediate action to maintain traffic or to resolve any other problem that might arise.
- b. Submit, by certified mail, the phone numbers and names of personnel designated to be contacted in cases of emergencies, along with a description of the project location, to the Miami-Dade Police and all other local law enforcement agencies.

M. General Inspection Requirements

1. Cooperation by Contractor:

- a. Notify Engineer daily where each of his crews will be working and what work will be done. This notification shall be given each weekday between 3:00 p.m. and 4:00 p.m. on the prior day.
- b. Do not perform work or furnish materials without obtaining inspection by Engineer or his representative. Furnish Engineer with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the Contract Documents.
- c. If Engineer so requests at any time before final acceptance of the work, remove or uncover such portions of the finished work as directed. After examination, restore the uncovered portions of the work to the standard required by the Contract Documents. If Engineer determines that the work so exposed or examined is

unacceptable, perform the uncovering or removal, and the replacing of the covering or making good of the parts removed, at no expense to the County. However, if Engineer determines that the work thus exposed or examined is acceptable, the County will pay for the uncovering or removing, and the replacing of the covering or making good of the parts removed in accordance with the terms of the Contract Documents.

2. Failure of Engineer to Reject Work During Construction: If, during or prior to construction operations, Engineer fails to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject in no way prevents the later rejection when such defect is discovered, or obligates the County to final acceptance. The County is not responsible for losses suffered due to any necessary removals or repairs of such defects.
3. Failure to Remove and Renew Defective Materials and Work: If Contractor fails or refuses to remove and renew any defective materials used or work performed, or to make any necessary repairs in an acceptable manner and in accordance with the requirements of the Contract within the time indicated in writing, the Engineer has the authority to repair, remove, or renew the unacceptable or defective materials or work as necessary, all at Contractor's expense. The Department will obtain payment for any expense it incurs in making these repairs, removals, or renewals, that Contractor fails or refuses to make, by deducting such expenses from any moneys due or which may become due Contractor, or by charging such amounts against the Contract bond.
4. Inspection by State and/or Federal Government: When the State of Florida and/or the United States Government pays a portion of the cost of construction, their representatives may inspect the construction work as they deem necessary. However, such inspection(s) will in no way make the State or the Federal Government a party to the Contract.

N. Final Inspection

1. Maintenance until Acceptance: Maintain all Work until Engineer has given final acceptance in accordance with the requirements of the Contract Documents.
2. Inspection for Acceptance:
 - a. Upon notification that all Contract Work, or all Contract Work on the portion of the Contract scheduled for acceptance, has been completed, Engineer will make an inspection for acceptance. The inspection will be made within seven days of the notification. If Engineer finds that all work has been satisfactorily completed, the Department will consider such inspection as the final inspection. If any or all of the Work is found to be unsatisfactory, Engineer will detail the remedial work required to achieve acceptance. Immediately perform such

remedial work. Subsequent inspections will be made on the remedial work until Engineer accepts all Work.

- b. Upon satisfactory completion of the Work, the Department will provide written notice of acceptance, either partial or final, to Contractor.
 - c. Until final acceptance in accordance with the requirements of the Contract Documents, replace or repair any damage to the accepted Work.
3. Partial Acceptance: At Engineer's sole discretion, Engineer may accept any portion of the Work under the provisions stipulated above.
 4. Conditional Acceptance: Engineer will not make, or consider requests for conditional acceptance of a project.
- O. Final Acceptance.
- a. When, upon completion of the final construction inspection of the entire Project, Engineer determines that Contractor has satisfactorily completed all the Work and furnished all documents required by the Contract Documents, Engineer will give Contractor written notice of final acceptance. Final Acceptance shall also denote the beginning of any warranty periods associated with the Project.

1.04 CONTROLLING MATERIALS

A. Acceptance Criteria

1. General:

- a. All materials and equipment, except for materials specifically called for on the Contract Documents to be provided by the County, are to be supplied by the Contractor who must, as required, obtain shop drawing approvals and order these items in a timely fashion so as not to cause any delays in the approved schedule.
- b. Acceptance of materials is based on the criteria provided herein and elsewhere in the Contract Documents. All requirements may not apply to all materials. Use only materials in the Work that meet the requirements of the Contract Documents. Engineer may inspect and test any material, at points of production, distribution and use.

2. Sampling and Testing:

- a. Use sample identification and tracking forms approved by Engineer to provide related information and attach the information to each sample. Restore immediately any site from which material has been removed for sampling purposes to the pre-sampled condition with materials and construction methods used in the initial construction, at no

additional cost to the County. Ensure that sufficient material is delivered to allow for proper sample collection, at no expense to the County.

b. Where required:

- 1) Pretest by Manufacturers: Submit certified manufacturer's test results to Engineer for qualification and use on the Project. Testing will be as specified in the Contract Documents. The Department may require submittal from manufacturers of samples of materials for independent verification purposes.
- 2) Point of Production Test: Test the material during production as specified in the Contract Documents.
- 3) Point of Distribution Test: Test the material at Distribution facilities as specified in the Contract Documents.
- 4) Point of Use Test: Test the material immediately following placement as specified in the Contract Documents. After delivery to the Project, the Department may require the retesting of materials that have been tested and accepted at the source of supply, or may require the testing of materials that are to be accepted by Producer Certification. The Department may reject all materials that, when retested, do not meet the requirements of the Contract Documents.

3. Certification:

- a. Manufacturer Material Certification: Submit material certifications for all materials to Engineer for approval when required by the Specifications. Materials will not be considered for payment when not accompanied by a material certification. Sample material certification forms are available on the FDOT's website at the following URL:
<http://www.fdot.gov/materials/navigation/documents.shtml>
- b. Ensure that the material certification follows the format of the sample form, is submitted on the manufacturer's letterhead and is signed by a legally responsible person employed by the manufacturer.
- c. FDOT Approved Product List (APL): The Department will limit Contractor's use of products and materials that require use of APL items to those listed on the APL effective at the time of placement.
- d. Traffic Signals and Signs (TSS) Division's Qualified Products List (TSSQPL):
 - 1) Only those traffic control equipment and materials listed in the DTPW Traffic Signals and Signs (TSS) Division's Qualified Products List (TSSQPL), or

submitted to and approved in writing by the DTPW TSS for addition to the TSSQPL, are allowed to be installed within Miami-Dade County. Equipment or material used in the performance of the Work, without prior Departmental approval, must be replaced with Department approved equipment or material, at no cost to the County. The TSSQPL is available at <http://www.miamidade.gov/qpl/Home.aspx>

- e. Contractor Installation Certification: Provide installation certifications as required by the Contract Documents.

B. Applicable Documented Authorities Other Than Specifications

1. General: Details on individual materials are identified in various material specific Sections of the Specifications that may refer to other documented authorities for requirements. When specified, meet the requirements as defined in such references.
2. Test Methods: Methods of sampling and testing materials are in accordance with the Florida Methods (FM). If a Florida Method does not exist for a particular test, perform the testing in accordance with the method specified in the Specification. When test methods or other standards are referenced in the Specifications without identification of the specific time of issuance, use the most current issuance, including interims or addendums thereto, at the time of bid opening.

3. Construction Aggregates:

- a. Unless otherwise specified in the Contract Documents:
 - 1) All aggregate products and sources used in performance of the Work must be approved by FDOT pursuant to Rule 14-103, F.A.C. Aggregates and sources used must be identified in the FDOT "Approved Aggregate Products from Mines or Terminals" listings current at the time the aggregate is proposed for use on the Project.
 - 2) Each truck aggregate load ticket provided must include the DTPW Project Name and Number, name of the aggregate source, the FDOT Source Number, quantity, aggregate description and corresponding FDOT material code, producer ticket number, and statement "CERTIFIED FOR FDOT" or "CERT. FOR FDOT."

C. Storage of Materials and Samples

1. Method of Storage: Store materials in such a manner as to preserve their quality and fitness for the work, to facilitate prompt inspection, and to minimize noise impacts on sensitive receivers. More detailed

requirements concerning the storage of specific materials are prescribed under the applicable Specifications. The Department may reject improperly stored materials.

2. Use of Right-of-Way for Storage: Unless otherwise stated in the Contract Documents, no Project staging areas have been provided by the County. If Engineer allows, Contractor may use a portion of the right-of-way for temporary storage purposes and for temporarily placing Contractor's plant and equipment. Use only the portion of the right-of-way that is outside the clear zone, which is the portion not required for public vehicular or pedestrian travel. When used, restore the right-of-way to pre-construction condition at no additional cost to the County or as specified in the Contract Documents. Provide any additional space required at no expense to the County.
3. Responsibility for Stored Materials: Accept responsibility for the protection of stored materials. The Department is not liable for any loss of materials, by theft or otherwise, or for any damage to the stored materials.
4. Storage Facilities for Samples: Provide facilities for storage of samples as described in the Contract Documents and warranted by the test methods and Specifications.

D. Defective Materials

1. Materials not meeting the requirements of the Contract Documents will be considered defective. Engineer will reject all such materials, whether in place or not. Remove all rejected material immediately from the site of the work and from storage areas, at no expense to the County.
2. Do not use material that has been rejected and the defects corrected, until Engineer has approved the material's use. Upon failure to comply promptly with any order of Engineer made under these provisions, Engineer will remove and replace defective material and deduct the cost of removal and replacement from any moneys due or to become due to Contractor.
3. As an exception to the above, Contractor may submit, upon approval of Engineer, an engineering and/or laboratory analysis to evaluate the effect of defective in-place materials. A Specialty Engineer, who is an independent consultant or Contractor's Engineer of Record as stated within each individual Section shall perform any such analysis. Engineer will determine the final disposition of the material after review of the information submitted by Contractor. No additional monetary compensation or time extension will be granted for the impact of any such analysis or review.

E. Products and Source of Supply

1. Source of Supply—Convict Labor (Federal-Aid Contracts Only):
 - a. Do not use materials that were produced after July 1, 1991, by convict labor for Federal-aid highway construction projects

unless the prison facility has been producing convict-made materials for Federal-aid highway construction projects before July 1, 1987.

- b. Use materials that were produced prior to July 2, 1991, by convicts on Federal-aid highway construction projects free from the restrictions placed on the use of these materials by 23 U.S.C. 114. The Department will limit the use of materials produced by convict labor for use in Federal-aid highway construction projects to:

- 1) Materials produced by convicts on parole, supervised release, or probation from a prison or,
- 2) Materials produced in a qualified prison facility.

- c. The amount of such materials produced for Federal-aid highway construction during any 12-month period shall not exceed the amount produced in such facility for use in such construction during the 12-month period ending July 1, 1987.

2. Buy American: Contractor must comply with the requirements of Miami Dade County Code, Section 2-8.2.6.1, Buy American Iron and Steel Products Procurement Program:

- a. The Buy American legislation requires that iron and steel products utilized in certain Miami-Dade County public improvement projects be produced in the United States. This requirement shall not apply if:

- 1) The project is federal funded.
- 2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- 3) upon a written recommendation of the County Mayor approved by a majority vote of the Board members present, compliance with this requirement is not consistent with the best interests of the public.

3. Source of Supply-Steel (Federal-Aid Contracts Only):

- a. Use steel and iron manufactured in the United States, in accordance with the Buy America provisions of 23 CFR 635.410, as amended. Ensure that all manufacturing processes for this material occur in the United States. As used in this specification, a manufacturing process is any process that modifies the chemical content, physical shape or size, or final finish of a product, beginning with the initial melting and continuing through the final shaping and coating. If a steel or iron product is taken outside the United States for any manufacturing process, it becomes foreign source material. When using steel or iron materials as a component of any prestressed

beams, corrugated steel pipe, etc.), these same provisions apply manufactured product (e.g., concrete pipe. Foreign steel and iron may be used when the total actual cost of such foreign materials does not exceed 0.1% of the total Contract amount or \$2,500, whichever is greater.

- b. These requirements are applicable to all steel and iron materials incorporated into the finished work, but are not applicable to steel and iron items that the Contractor uses but does not incorporate into the finished work. Submit certification from the manufacturer of steel or iron, or any product containing steel or iron, stating that all steel or iron furnished or incorporated into the furnished product was produced and manufactured in the United States or a statement that the product was produced within the United States except for minimal quantities of foreign steel and iron valued at \$ Submit (actual cost). each such certification to the Engineer prior to incorporating the material or product into the project. Prior to the use of foreign steel or iron materials on a project, document the actual cost of such material submit invoices to, and obtain the Engineer's written approval prior to incorporating the material into the project.

4. Contaminated Unfit, Hazardous, and Dangerous Materials:

- a. Do not use any material that, after approval and/or placement, has in any way become unfit for use.
- b. Do not use materials containing any substance that has been determined to be hazardous by the State of Florida Department of Environmental Protection or the U.S. Environmental Protection Agency (EPA). Provide workplaces free from serious recognized hazards and to comply with occupational safety and health standards, as determined by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA).

1.05LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC

A. Disaster Preparedness

1. General:

- a. During periods in which any portion of Miami-Dade County is designated by the National Oceanic and Atmospheric Administration's National Hurricane Center as being under a Tropical Storm Watch or greater, Contractor shall perform all precautions as necessary to safeguard the Work and property, including the removal of all small equipment and materials from the site, securing all other equipment and materials to each other and to

rigid construction, and any other safety measures as may be directed by Engineer.

2. Upon Notification of a Tropical Storm or Hurricane Watch:

- a. Engineer will provide formal notification to Contractor to prepare and submit for approval a Plan of Action for the specific actions to be taken on their particular projects.

3. Upon Notification of a Tropical Storm or Hurricane Warning:

- a. Engineer will provide formal notification to Contractor to implement the approved Plan of Action to protect the Project and the public.
- b. For construction projects within the public right-of-way, Contractor will be notified by Engineer to suspend his construction operations. Contractor will backfill all open trenches, remove all construction equipment and materials from the right-of-way, remove unnecessary traffic barricades and signs, and secure remaining barricades by "half burial" or "double sand bags."

4. Storm or Disaster Services:

- a. Contractor, by accepting the award of this Contract, recognizes and agrees that should a storm or other severe and catastrophic natural disaster affect the Miami-Dade-County area during the performance of the work, Contractor shall provide services contracted for during the contract period, at the Contract unit prices and at the same or different locations from those covered by this Contract.
- b. For emergency services and conditions not addressed by this Contract, Contractor agrees to negotiate reasonable prices and terms with the County for any disaster-relief work required by the County. In all instances, Contractor agrees to negotiate reasonable time extensions for performance of disaster-relief work.

B. Laws to be Observed

1. General:

- a. Become familiar with and comply with all applicable Federal, State, County, and city laws, by-laws, ordinances, and regulations that control the action or operation of those engaged or employed in the Work or that affect materials used. Pay particular attention to the applicable safety regulations promulgated by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). In addition, comply with Chapter 403, F.S. (Florida Statutes), regarding control of air pollution. Direct special attention to that portion of Chapter 17-5, F.A.C. (Florida Administrative Code), pertaining to open burning in land clearing

operations. Where work or structures included in the Contract are in "Navigable Waters of the U.S.," (reference 33 of the Code of Federal Regulations, Part 329); "Waters of the U.S.," (reference 33 of the Code of Federal Regulations, Parts 323 and 328); or "Waters of the State," (reference Part 4, Chapters 253 and 373 of the Florida Statutes and Section 62-340, F.A.C.); comply with the regulatory provisions of Section 404 of the Federal Clean Water Act of 1977; Sections 9 and 10 of the Federal River and Harbor Act of 1899; Chapter 161, F.S.; and any local authority having jurisdiction over such waters.

- b. Obtain certification from the Construction Industry Licensing Board as required by Part I, Chapter 489, F.S., regardless of exemptions allowed by Section 489.103, F.S., prior to removing underground pollutant storage tanks. Dispose of tanks and pollutants in accordance with the requirements and regulations of any Federal, State, or local, agency having jurisdiction.
 - c. Prior to building construction or renovation, provide copies of current registrations or certifications issued by the Florida Construction Industry Licensing Board in accordance with Chapter 489, F.S. for the appropriate category of construction.
 - d. Corporations must be registered with the State of Florida, Department of State, Division of Corporations, and hold a current State Corporate Charter Number in accordance with Chapter 607, F.S.
 - e. Contractor or the authorized subcontractor applying any roofing material must be licensed or be an approved dealer and applicator of the proposed roofing material.
 - f. Indemnify, defend, and save harmless the County and all of its officers, agents, and employees, in the amount of the Contract price, against all claims or liability arising from or based on the violation of any such laws, by-laws, ordinances, regulations, order, or decrees; whether by himself or his employees.
2. Plant Quarantine Regulations: The U.S. Department of Agriculture and the Florida Department of Agriculture and Consumer Services have issued quarantine regulations pertaining to control of the nematodes of citrus, Rule 5B-44, Florida Administrative Code, and other plant pests. Contact the local (or other available) representatives of the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture, and the Division of Plant Industry of the Florida Department of Agriculture and Consumer Services to ascertain all current restrictions regarding plant pests that are imposed by these agencies. Keep advised of current quarantine boundary lines throughout the construction period.
- a. These restrictions may affect operations in connection with such items as clearing and

grubbing, earthwork, grassing and mulching, sodding, landscaping, and other items which might involve the movement of materials containing plant pests across quarantine lines.

- b. Obtain quarantine regulations and related information from the following:

Animal and Plant Health Inspection Service
U.S. Department of Agriculture
3029 Lake Alfred Road
Winter Haven, Florida 33881

Director, Division of Plant Industry
Florida Department of Agriculture and Consumer Services
Post Office Box 147100
Gainesville, Florida 32614-7100

3. Introduction or Release of Prohibited Aquatic Plants, Plant Pests, or Noxious Weeds:
 - a. Do not introduce or release prohibited aquatic plants, plant pests, or noxious weeds into the project limits as a result of clearing and grubbing, earthwork, grassing and mulching, sodding, landscaping, or other such activities. Immediately notify Engineer upon discovery of all prohibited aquatic plants, plant pests, or noxious weeds within the project limits. Do not move prohibited aquatic plants, plant pests, or noxious weeds within the project limits or to locations outside of the project limits without Engineer's permission. Maintain all borrow material brought onto the project site free of prohibited aquatic plants, plant pests, noxious weeds, and their reproductive parts. Refer to Rule 16C-52 and Rule 5B-57, F.A.C. for the definition of prohibited aquatic plants, plant pests, and noxious weeds.
 - b. Furnish Engineer, prior to incorporation into the Project, with a certification from the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, stating that the sod, hay, straw, and mulch materials are free of noxious weeds, including Tropical Soda Apple.
4. Compliance with Federal Endangered Species Act and other Wildlife Regulations:
 - a. The Federal Endangered Species Act requires that the Department investigate the potential impact to a threatened or endangered species prior to initiating an activity performed in conjunction with a highway construction project. If the Department's investigation determines that there is a potential impact to a protected, threatened or an endangered species, the Department will conduct an evaluation to determine what measures may be necessary to mitigate such impact. When mitigation measures and/or special conditions are necessary, these measures and conditions

will be addressed in the Contract Documents or in permits as identified in 7-2.1.

- b. In addition, in cases where certain protected, threatened or endangered species are found or appear within close proximity to the project boundaries, the Department has established guidelines that will apply when interaction with certain species occurs, absent of any special mitigation measures or permit conditions otherwise identified for the project. These guidelines are posted at the following URL address:
https://fdotwww.blob.core.windows.net/sitefinity/docs/defaultsource/programmanagement/implemented/urlsinspecs/files/endangeredwildlife/guidelines.pdf?sfvrsn=e27baf3f_2.

Take responsibility to obtain this information and take all actions and precautions necessary to comply with the conditions of these guidelines during all project activities.

- c. Prior to establishing any off-project activity in conjunction with a project, notify the Engineer of the proposed activity. Covered activities include but are not necessarily limited to borrow pits, concrete or asphalt plant sites, disposal sites, field offices, and material or equipment storage sites. Include in the notification the Financial Project ID, a description of the activity, the location of the site by township, range, section, county, and city, a site location map including the access route, the name of the property owner, and a person to contact to arrange a site inspection. Submit this notification at least 30 days in advance of planned commencement of the off-site activity, to allow for the Department to conduct an investigation without delaying job progress.
 - d. Do not perform any off-project activity without obtaining written clearance from the Engineer. In the event the Department's investigation determines a potential impact to a protected, threatened or endangered species and mitigation measures or permits are necessary, coordinate with the appropriate resource agencies for clearance, obtain permits and perform mitigation measures as necessary. Immediately notify the Engineer in writing of the results of this coordination with the appropriate resource agencies. Additional compensation or time will not be allowed for permitting or mitigation, associated with Contractor initiated off-project activities.
5. Occupational Safety and Health Requirements: Contractor shall take all precautions necessary for the protection of life, health, and general occupational welfare of all persons, including employees of both Contractor and the County, until Contractor has completed the work required under the Contract. Comply at all times with applicable Federal, State, and local laws, provisions, and policies governing safety

and health, including 29 CFR 1926, including all subsequent revisions and updates.

- 6. Discovery of an Unmarked Human Burial: When an unmarked human burial is discovered, immediately cease all activity that may disturb the unmarked human burial and notify Engineer. Do not resume activity until specifically authorized by Engineer.
- 7. Insecticides and Herbicides: Use products approved by the Florida Department of Agriculture for the State of Florida, found on the following website <http://state.ceris.purdue.edu/>. The use of restricted products is prohibited. Do not use any products in the sulfonyleurea family of chemicals. Herbicide application by broadcast spraying is not allowed.
 - a. Procure any necessary licenses, pay all charges and fees, and give all notices necessary for lawful performance of the work.
 - b. Ensure that all employees applying insecticides and herbicides possess a current Florida Department of Agriculture Commercial Applicator license with the categories of licensure in Right-of-Way Pest Control and Aquatic Pest Control. Provide a copy of current certificates upon request, to Engineer.
 - c. Ensure that employees who work with herbicides comply with all applicable Federal, State, and local regulations.
 - d. Comply with all regulations and permits issued by any regulatory agency within whose jurisdiction work is being performed. Post all permit placards in a protected, conspicuous location at the work site.
 - e. Acquire any permits required for work performed on the rights-of-way within the jurisdiction of National Forests in Florida. Contact the Local National Forest Ranger District, or the United States Department of Agriculture (USDA) office for the proper permits and subsequent approval.
 - f. Acquire all permits required for aquatic plant control as outlined in Chapter 62C-20, F.A.C., Rules of the Florida Department of Environmental Protection. Contact the Regional Field Office of Bureau of Invasive Plant Management of the Florida Department of Environmental Protection for proper permits and subsequent approval. If application of synthetic organo-auxin herbicides is necessary, meet the requirements of Chapter 5E-2, F.A.C.
 - g. Fertilizer: Ensure that all employees applying fertilizer, possess a current Florida Department of Agriculture and Consumer Services Commercial Applicator license in accordance with Section 482.1562, F.S. Upon request, submit the current certificates to the Engineer.
- 8. Compliance with Section 4(f) of the USDOT Act: (Staging Areas)

- a. Section 4(f) of the USDOT Act prohibits the U. S. Secretary of Transportation from approving a project which requires the use of publicly owned land of a public park, recreation area or a wildlife and waterfowl refuge, or of any historic site of national, state, or local significance unless there is no prudent or feasible alternative to using that land and the program or project includes all possible planning to minimize the harm to the site resulting from the use.
- b. Before undertaking any off-project activity associated with any federally assisted undertaking, ensure that the proposed site does not represent a public park, recreation area, wildlife or waterfowl refuge, or a historic site (according to the results of the Cultural Resources Survey discussed under FDOT 120-6.2). If such a site is proposed, notify the Engineer and provide a description of the proposed off-site activity, the location of the site by township, range, section, a county or city map showing the site location, including the access route and the name of the property. It is the Contractor's responsibility to submit justification for use of Section 4(f) property that is sufficient for the Florida Department of Transportation and the Federal Highway Administration to make a Section 4(f) determination. Submit this notification sufficiently in advance of planned commencement of the off-site activity to allow a reasonable time for the Engineer to conduct an investigation without delaying job progress. Do not begin any off-project activity without obtaining written clearance from the Engineer

9. Employment Eligibility Verification

- a. The Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Contractor during the term of the Contract and shall expressly require any subcontractors performing work or providing services pursuant to the Contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the Contract term.
- b. Miami-Dade County reserves the right, at any time, to request supporting documentation, as evidence of services provided and demonstration of compliance with the above requirements.

C. Permits and Licenses

1. General:

- a. Except for permits procured by the Department, as incorporated by Special Provision to this Contract, if any, procure all permits and licenses, pay all charges and

fees, and give all notices necessary and incidental to the due and lawful prosecution of the Work.

- b. The Department will also acquire any modifications or revisions to an original permit incorporated by Special Provision to this Contract when Contractor requires such modifications or revisions to complete the construction operations specified in the Plans or Special Provisions and within the right-of-way limits.
- c. Contractor must obtain all other permits required for this Project prior to commencing the Work. This includes permits required by other municipalities and agencies, permits to work in the Right-of-Way, and those required for the removal or relocation of trees.
- d. The actual amount paid for the permits will be reimbursed to Contractor from a dedicated allowance established by the County. If no dedicated allowance is specified the reimbursement shall be paid from the Contract's Contingency Allowance. Original receipts must be presented to Engineer for approval.
- e. Contractor must give all notices, pay all fees and comply with all laws, rules and regulations applicable to the Work at no additional cost.
- f. Acquire all permits for work performed outside the right-of-way or easements for the Project.
- g. In carrying out the work in the Contract, when under the jurisdiction of any environmental regulatory agency, comply with all regulations issued by such agencies and with all general, special, and particular conditions relating to construction activities of all permits issued to the Department as though such conditions were issued to Contractor. Post all permit placards in a protected location at the worksite.
- h. In case of a discrepancy between any permit condition and other Contract Documents, the more stringent condition shall prevail.

2. Additional Contractor Requirements For Work With Traffic Control Devices or Street Lighting

- a. In addition to the license(s) required of Contractor, all personnel engaged in installing, modifying, repairing, removing or maintaining: roadway street lighting systems; traffic signalization; or any other electrical/electronic traffic control device in Miami-Dade County must:
 - 1) Perform work under the direction of a Master Electrician that is present at the job site or able to respond within 2 hours of notification (4 hours for roadway street lighting systems).
 - 2) Perform all work under the direct supervision of a Journeyman Electrician.

For Traffic Signalization or Control Devices the Journeyman Electrician must be certified as an International Municipal Signal Association (IMSA) certified Traffic Signal Technician (TST) Level II or Level III. All work related at or pertaining to the controller must be performed by an IMSA certified TST Level II (Field).

- 3) Have in their possession a wallet size card or a photocopy of their certifications and licenses. Failure to provide said documents will be cause for removal of employee from the work site, issuance of citations, and shutdown of the Work by the County.
- b. At the Preconstruction Conference, provide Engineer and the DTPW, Traffic Signal & Signs Division (7100 NW 36 Street, Miami, FL 33166) a signed affidavit affirming that the personnel performing the work described herein have all proper and valid licenses and certifications (County, State, Private or other Government Agency) required to perform the Work. Attach a list of employees assigned to this Project with a description of their duties and include copies of all of the required licenses and certifications for the Contractor and personnel performing the Work. Changes to authorized personnel must be approved by the Engineer.
- c. Provide copies of renewed licenses and certifications prior to their expiration.
3. Work or Structures in Navigable Waters of the U.S., Waters of the U.S., and Waters of the State:
 - a. In general, one or more governmental agencies will exercise regulatory authority over work or structures, including related construction operations, in all tidal areas (Channelward of the mean high water lines); in the ocean and gulf waters to the outer limits of the continental shelf; in all rivers, streams, and lakes to the ordinary high water line; in marshes and shallows that are periodically inundated and normally characterized by aquatic vegetation capable of growth and reproduction; in all artificially created channels and canals used for recreational, navigational, or other purposes that are connected to navigable waters; and in all tributaries of navigable waters up to their headwaters.
 - b. Whenever the work under or incidental to the Contract requires structures or dredge/fill/construction activities in "Navigable Waters of the U.S.," "Waters of the U.S.," and "Waters of the State," the Federal, State, county, and local regulatory agencies may require the Department to obtain a permit. For such dredge/fill /construction specified in the plans to be accomplished within the limits of the project, or for any dredge/fill/construction within the

limits of Department-furnished borrow areas, the Department will procure the necessary permits prior to advertising for bids.

D. Patented Devices, Materials and Processes

1. Include all royalties and costs arising from patents, trademarks, and copyrights, in any way involved in the work in the Contract price. Whenever using any design, device, material, or process covered by letters patent or copyright, obtain the right for such use by suitable legal agreement with the patentee or owner of the copyright. File a copy of such agreement with Engineer. However, whether or not such agreement is made or filed as noted, Contractor and the surety in all cases shall indemnify, defend, and save harmless, the County from all claims for infringement by reason of the use of any such patented design, device, material, or process on work under the Contract, and shall indemnify the County for all costs, expenses, and damages that it may be obliged to pay by reason of any such infringement, at any time during the prosecution or after the completion of the Work.

E. Right-of-Way Furnished by the Department

1. Except as otherwise stipulated in these Specifications or as shown in the Plans, the Department will furnish all rights-of-way necessary for the proper completion of the Work at no expense to Contractor.

F. Sanitary Provisions

1. Contractor shall provide and maintain, in a neat and sanitary condition, such accommodations for the use of his employees as are necessary to comply with the requirements and regulations of the State and local boards of health. Commit no public nuisance.

G. Control of Contractor's Equipment

1. Traffic Interference: Do not allow equipment, while it is on or traversing a road or street, to unreasonably interfere with traffic.
2. Overloaded Equipment: Do not operate on any road or street any hauling unit or equipment loaded in excess of (1) the maximum weights specified in the Florida Uniform Traffic Control Law, or (2) lower weights legally established for any section of road or bridge by the State, the Department, or local authorities. The governmental unit having jurisdiction over a particular road or bridge may provide exceptions by special permit under the provisions provided below for Crossings. This restriction applies to all roads and bridges inside and outside the Contract limits as long as these roads and bridges are open for public use. Contractor may overload roads and bridges which are to be demolished after they are permanently closed to the public. Contractor is responsible for all loss or damages resulting from equipment operated on a structure permanently closed to the public.
3. Crossings: Where it is necessary to cross an existing road or street, including specifically the existing

traveled lanes of a divided highway within the limits of the Project, obtain permits from the Municipality, the Department or FDOT depending on the location, for crossing overloaded or oversized equipment. Cross existing roads or streets only at Engineer-designated points. Engineer may require Contractor to protect the pavement or Roadway at the crossing by using lumber, planks, or fill. Provide flagging and watchman service, or approved signal devices, for the protection of traffic at all such crossings, in accordance with an approved written plan for that activity.

4. Protection from Damage by Tractor-Type Equipment: Take positive measures to ensure that tractor-type equipment does not damage the road. If any such damage should occur, repair it without delay, at no expense to the County and subject to Engineer's approval.

H. Contractor's Equipment on Bridge Structures

1. The Specialty Engineer shall determine the effect that equipment loads have on the bridge structure and develop the procedures for using the loaded equipment without exceeding the structure's design load capacity.
2. A completed bridge structure is a bridge structure in which all elemental components comprising the load carrying assembly have been completed, assembled, and connected in their final position. The components to be considered shall also include any related members transferring load to any bridge structure.
3. The Specialty Engineer shall analyze the effect of imposed loads on bridge structures, within the limits of a construction contract, resulting from the following operations:
 - a. Overloaded Equipment as defined above operating on or crossing over completed or partially completed bridge structures.
 - b. Equipment within legal load limits operating on or crossing over partially completed bridge structures.
 - c. Construction cranes operating on completed or partially completed bridge structures.
4. Submit to the Department for approval three copies of design calculations, layout drawings, and erection drawings showing how the equipment is to be used so that the bridge structure will not be overstressed. The Specialty Engineer shall sign and seal one set of the three copies of the drawings and the cover sheet of one of the three copies of the calculations for the Department's Record Set.
5. Any pipe culvert(s) or box culvert(s) qualifying as a bridge by definition is excluded from the requirements above.
6. Posting of the Legal Gross Vehicular Weight: Display the maximum legal gross weight, as specified in the Florida Uniform Traffic Code, in a permanent manner on each side of any dump truck or dump type tractor-trailer unit hauling embankment material, construction aggregates, road base material, or hot bituminous mixture to the project over any public road or street.

Display the weight in a location clearly visible to the scale operator, in numbers that contrast in color with the background and that are readily visible and readable from a distance of 50 feet.

I. Structures over Navigable Waters

1. Compliance with Federal and Other Regulations:

- a. Where erecting structures in, adjacent to, or over, navigable waters, observe all regulations and instructions of Federal and other authorities having control over such waters. Do not obstruct navigation channels without permission from the proper authority, and provide and maintain navigation lights and signals in accordance with the Federal requirements for the protection of the structure, of false work, and of navigation.
- b. In the event of accidental blocking of the navigation channel, immediately notify the U.S. Coast Guard of the blockage and upon removal of the blockage.
- c. When work platforms are indicated in the permit for construction, submit work platform construction plans to the appropriate Coast Guard District for approval. Obtain approval prior to beginning construction on the platform.

2. Maintenance of Channel: Where the work includes the excavation of a channel or other underwater areas to a required section, maintain the section from shoaling or other encroachment until final acceptance of the project.

J. Manatee Protection

1. This Subarticle applies to work in tidal waters, major canals, bodies of water where manatees have been recently spotted, or where required by any regulatory permit applicable to this Project:
 - a. Instruct all personnel associated with the Project about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. Advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
 - b. Operate all vessels associated with the construction project at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
 - c. Properly secure and regularly monitored all siltation or turbidity barriers to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement. Siltation or

turbidity barriers must be made of material in which manatees cannot become entangled.

- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shut down if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Report any collision with or injury to a manatee immediately to the FWC Hotline at 1-888-404-3922. In addition, report collision and/or injury to the U.S. Fish and Wildlife Service in Vero Beach (1-772-562-3909), and to FWC at ImperiledSpecies@myFWC.com
- f. Post, facing the water, temporary signs concerning manatees prior to and during all in-water project activities. One sign which reads "Caution: Boaters" must be posted. A second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. Use temporary signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used (see MyFWC.com/manatee). Questions concerning these signs can be sent to the email address listed above. Remove all signs upon completion of the Project.
- g. Comply with all manatee protection requirements of regulatory permits applicable to this Project.

K. Forest Protection

- 1. Compliance with State and Federal Regulations: In carrying out work within or adjacent to State or National forests or parks, comply with all of the regulations of the State or Federal authority having jurisdiction, governing the protection of and the carrying out of work in forests or parks, and observe all sanitary laws and regulations with respect to the performance of work in these areas. Keep the areas in an orderly condition, dispose of all refuse, and obtain permits for the construction, installation, and maintenance of any construction camps, living quarters, stores, warehouses, sanitary facilities, and other structures; all in accordance with the requirements of the forest or park official.
- 2. Prevention and Suppression of Forest Fires: Take all reasonable precautions to prevent and suppress forest fires. Require employees and subcontractors, both independently and at the request of forest officials, to do all reasonably within their power to prevent and

suppress forest fires. Assist in preventing and suppressing forest fires, and make every possible effort to notify a forest official at the earliest possible moment of the location and extent of all fires. Extinguish the fire if practicable.

L. Preservation of Property

1. General:

- a. Protect all geodetic monuments, horizontal or vertical, located within the limits of construction.
- b. All street name signs shall remain in place during time of construction except those required to be relocated due to interference with actual construction. All signs relocated or damaged by Contractor during the course of the work shall be re-installed or replaced at the proper location, as soon as possible at Contractor's expense.
- c. Prior to the removal of any traffic control signs that interfere with the construction, Contractor shall provide temporary signing or other provisions to assure a continuous flow of traffic under at least the same conditions as previously existed.
- d. All signs that are found to be unserviceable shall be reported to the Miami-Dade County, Department of Transportation and Public Works, Traffic Signals & Signs Division, at (305) 592-3580, prior to the commencement of work.

2. Contractor's Use of Streets and Roads:

- a. When hauling materials or equipment to the project over roads and bridges on the State road system, County road system, or city street system, and such use causes damage, immediately, at no expense to the County, repair such road or bridge to as good a condition as before the hauling began.
- b. The Department may modify the above requirement in accordance with any agreement Contractor might make with the governmental unit having jurisdiction over a particular road or bridge, provided that Contractor submits written evidence of such agreement to Engineer prior to commencement of the Work.
- c. The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Contractor shall so conduct his operations that he shall not close any thoroughfare nor interfere in any way with traffic on railway, highways, or on water, without the written consent of the proper authorities.
- d. Contractor must immediately remove any earth or other excavated material spilled from trucks and clean the streets to the satisfaction of the governing authority.

- e. The Department has not made any attempt to define the equipment to be used in transporting the excavated material since this may vary, however, Contractor shall abide by the following general requirements:

- 1) Transport vehicles must be of the type(s) approved for this application by the political jurisdiction involved.
- 2) General requirements are that the vehicles have watertight bodies that they are properly equipped and fitted with seals and covers to prohibit material spillage or draining, and that they are cleaned as often as is necessary to prevent deposit of material on roadways.
- 3) Vehicles must be loaded within all legal weight limits and operated safely within all traffic and speed regulations.

- f. The Department will not allow the operation of equipment or hauling units of such weight as to cause damage to previously constructed elements of the project, including but not necessarily limited to bridges, drainage structures, base course, and pavement.
- g. Do not operate hauling units or equipment loaded in excess of the maximum weights specified for Overloaded Equipment on existing pavements that are to remain in place (including pavement being resurfaced), cement-treated subgrades and bases, concrete pavement, any course of asphalt pavement, and bridges.
- h. Engineer may allow exceptions to these weight restrictions for movement of necessary equipment to and from its worksite, for hauling of offsite fabricated components to be incorporated into the Project, and for crossings as specified in the Contract Documents.

3. Protection of Existing Utility Poles:

- a. Ensure that existing utility poles are properly protected during installation of pipes and structures and must coordinate with the utility pole owner any safeguards necessary to protect the utility pole, including bracing of the pole, if necessary. All costs for protection of utility poles and any costs for the temporary bracing by the utility pole owner shall be the responsibility of Contractor and shall be considered incidental to and included in the Contract prices.

4. Traffic Signs, Signal Equipment, Highway Lighting and Guardrail:

- a. Protect all existing roadside signs, signal equipment, highway lighting and guardrail, for which permanent removal is not indicated, against damage or displacement. Whenever such signs, signal equipment, highway lighting or guardrail lie within the limits of

construction, or wherever so directed by Engineer due to urgency of construction operations, take up and properly store the existing roadside signs, signal equipment, highway lighting and guardrail and subsequently reset them at their original locations or, in the case of widened pavement or roadbed, at locations designated by Engineer.

- b. If the Department determines that damage to such existing or permanent installations of traffic signs, signal equipment, highway lighting or guardrail is caused by a third party, and is not otherwise due to any fault or activities of Contractor, the Department will, with the exception of any damage resulting from vandalism, compensate Contractor for the costs associated with the repairs. Repair damage caused by vandalism at no expense to the County.

5. Operations Within Railroad Right-of-Way:

- a. Notification to the Railroad Company: Notify the superintendent of the railroad company, as shown on the Plans, and Engineer at least 72 hours before beginning any operation within the limits of the railroad right-of-way; any operation requiring movement of employees, trucks, or other equipment across the tracks of the railroad company at other than an established public crossing; and any other work that may affect railroad operations or property.
- b. Contractor's Responsibilities: Comply with whatever requirements an authorized representative of the railroad company deems necessary in order to safeguard the railroad's property and operations. Contractor is responsible for all damages, delays, or injuries and all suits, actions, or claims brought on account of damages or injuries resulting from Contractor's operations within or adjacent to railroad company right-of-way.
- c. Watchman or Flagging Services: The railroad company will furnish protective services (i.e., watchman or flagging services) to ensure the safety of railroad operations during certain periods of the project. The Department will reimburse the railroad company for the cost thereof. Schedule work that affects railroad operations so as to minimize the need for protective services by the railroad company.

6. Utilities:

- a. General:
 - 1) Contact the Sunshine State One Call of Florida, Inc. at 1-800-432-4770 and other affected utility owners at least 48 hours prior to commencing any trenching or excavation work on this Project.
 - 2) Make all necessary arrangements with the utility companies concerned for

maintenance of their lines during the construction period. In the event that a relocation of utilities is required, but has not been accomplished prior to the effective date of the "Notice to Proceed," Contractor nevertheless must commence work under this Contract, and must schedule his work to avoid interference with the utility relocation work.

- 3) County will not be liable for any delay or added expense the Contractor experiences due to the activities of utility companies, nor shall the County be held responsible for any damages to any utilities due to any actions by Contractor.

b. Arrangements for Protection or Adjustment:

- 1) Do not commence work at points where the construction operations are adjacent to utility facilities or other property, until making arrangements with the utility facilities to protect against damage that might result in expense, loss, disruption of service, or other undue inconvenience to the public or to the owners. Contractor is solely and directly responsible to the owners and operators of such properties for all damages, injuries, expenses, losses, inconveniences, or delays caused by Contractor's operations.
- 2) The Department will make the necessary arrangements with utility owners for removal or adjustment of utilities where Engineer determines that such removal or adjustment is essential to the performance of the required construction. The Department will not consider relocation or adjustment requests based on Contractor's proposed use of a particular method of construction or a particular type of equipment as essential to the construction of the Project if Contractor could use other common methods and equipment without relocating or adjusting the utility. Engineer will determine the responsibility for any such required adjustments of utilities. Contractor shall make all requested relocations or adjustments because of delivery to the job site of Contractor-furnished materials, at no expense to the County.
- 3) The Department considers relocations and adjustments (or other protection) under the following circumstances as essential to the construction of the Project:
 - a) Utilities lying within the vertical and horizontal construction limits, plus the reasonably required working room necessary for operation of

equipment normally used for the particular type of construction, all as determined by Engineer (and except as provided in paragraph (d) below). (In the case of overhead electrical conductors that carry more than 400 Volts, a minimum of 10 feet clearance between the conductor and the nearest possible approach of any part of the equipment is required, except where the utility owner effects safeguards approved by OSHA.)

- b) Utilities lying within the horizontal limits of the project and within 12 inches below the ground surface or the excavation surface on which Contractor operates construction equipment, or within 12 inches below the bottom of any stabilizing course specified in the Plans.
 - c) Utilities lying within the normal limits of excavation for underground drainage facilities or other structures (except as provided in paragraph (d) below). Such normal limits shall extend to side slopes along the angle of repose, as established by sound engineering practice, unless the Contract Documents require support of the excavation sides by sheeting or Contractor elects to sheet such excavation for his own convenience.
 - d) Where utilities cross pipe trenches transversely within the excavation area, but not within positions from which relocation or removal is necessary, the utility owner is responsible for providing and effecting all reasonable measures for their support and protection during construction operations. Cooperate with the utility owner in the owner's effecting of such support and protective measures. Contractor is responsible for all damage to the utility that is caused by Contractor's neglect or failure to cooperate or to use proper precaution in performing his work.
- 4) In the event that a temporary relocation of a utility or a particular sequence of timing in the relocation of a utility is necessary, Engineer will direct such relocation so as to cause the least impediment to the overall construction operations. The Department is not responsible for utility adjustments or temporary relocation work, or for the conditions resulting there from, where such adjustments are:
 - a) Not necessitated by the construction of the Project,

- b) Done solely for the benefit or convenience of the utility owner or its contractor, or Contractor where the Department considers his construction procedures to be other than normal, or
 - c) Not shown on the approved plans for the utility relocation or the construction of the Project.
 - c. Cooperation with Utility Owners:
 - 1) Cooperate with the owners of all underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication or rearrangement work may be reduced to a minimum, and that services rendered by the utility owners will not be unnecessarily interrupted.
 - 2) In the event of interruption of water or other utility services as a result of accidental breakage, exposure, or lack of support, promptly notify the proper authority and cooperate with the authority in the prompt restoration of service. If water service is interrupted and Contractor is performing the repair work, Contractor shall work continuously until the service is restored. Do not begin work around fire hydrants until the local fire authority has approved provisions for continued service.
 - d. Utility Adjustments:
 - 1) Certain utility adjustments and reconstruction work may be underway during the progress of the Contract. If known prior to award, the Department will include in the Contract documents the utility authorities who are scheduled to perform utility work on the Project.
 - 2) Cooperate with the various utility construction crews who are maintaining utility service.
 - 3) Exercise due caution when working adjacent to relocated utilities. Repair all damage to the relocated utilities resulting from his operations at no expense to the County.
 - 4) Protect utility facilities in accordance with the requirements of the Contract Documents and the owner.
 - e. Weekly Meetings:
 - 1) Conduct weekly meetings on the job site with all the affected utility companies and Engineer in attendance to coordinate project construction and utility relocation. Submit a list of all attendees one week in advance to Engineer for approval.
 - 2) Provide the approved Work Progress Schedule and Work Plan for the Project, as specified in the Contract Documents, to document the schedule and plan for road construction and utility adjustments.
 - 3) When utility relocations no longer affect construction activities, Contractor may discontinue the meetings with Engineer's approval.
- M. Responsibility for Damages, Claims, etc.
- 1. Contractor to Provide Indemnification:
 - a. Contractor shall indemnify and hold harmless the County, its officers and employees from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of Contractor and persons employed or utilized by Contractor in the performance of the construction Contract.
 - b. It is specifically agreed between the parties executing this Contract that it is not intended by any of the provisions of any part of the Contract to create in the public or any member thereof, a third party beneficiary hereunder, or to authorize anyone not a party to this Contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Contract.
 - 2. Guaranty of Payment for Claims: Contractor guaranties the payment of all just claims for materials, supplies, tools, or labor and other just claims against him or any subcontractor, in connection with the Contract. The Department's final acceptance and payment does not release Contractor's bond until all such claims are paid or released.
- N. Contractor's Responsibility for Work
- 1. Until the Department's acceptance of the work, take charge and custody of the work, and take every necessary precaution against injury or damage to the work by the action of the elements or from any other cause whatsoever, arising either from the execution or from the nonexecution of the work. Rebuild, repair, restore, and make good, without additional expense to the Department, all injury or damage to any portion of the work occasioned by any of the above causes before its completion and acceptance, except that in case of extensive or catastrophic damage, the Department may, at its discretion, reimburse Contractor for the repair of such damage due to unforeseeable causes beyond the control of and without the fault or negligence of Contractor, including but not restricted to Acts of God, of the public enemy, or of governmental authorities.
- O. Opening Sections of Roadway to Traffic

1. Whenever any bridge or section of roadway is in an acceptable condition for travel, Engineer may direct Contractor to open it to traffic. The Department's direction to open a bridge or roadway does not constitute an acceptance of the bridge or roadway, or any part thereof, or waive any Contract provisions. Perform all necessary repairs or renewals, on any section of the roadway or bridge thus opened to traffic under instructions from Engineer, due to defective material or work or to any cause other than ordinary wear and tear, pending completion and Engineer's acceptance of the roadway or bridge, or other work, at no expense to the County.

P. Scales for Weighing Materials

1. Applicable Regulations: When determining the weight of material for payment, use scales meeting the requirements of Chapter 531, F.S., pertaining to specifications, tolerances, and regulations, as administered by the Bureau of Weights and Measures of the Florida Department of Agriculture.
2. Base for Scales: Place such scales on a substantial horizontal base to provide adequate support and rigidity and to maintain the level of the scales.
3. Protection and Maintenance: Maintain all scale parts in proper condition as to level and vertical alignment, and fully protect them against contamination by dust, dirt, and other matter that might affect their operation.

Q. Source of Forest Products

1. As required by Section 255.20, F.S., where price and quality are equal, and when available, use only timber, timber piling, or other forest products that are produced and manufactured in the State of Florida. This provision does not apply to Federal-aid projects.

R. Dust Control

1. Dust control measures are required as necessary to prevent the surface and air transport of dust from any construction activity performed under this contract. This may include but is not limited to: Pre-watering deeply before excavation; scheduling thorough and consistent watering that does not run off the site; applying best management practices in the loading, offloading, and transport of soils and miscellaneous materials; covering or otherwise stabilizing piles when necessary; and planning schedules so control measures are available throughout the project.
2. Ensure that excessive dust is not transported beyond the limits of construction in populated areas. Contractor may control dust for embankments or other cleared or unsurfaced areas by applying water, as directed by Engineer. When included in the Plans, install mulch, seed, sod, or temporary paving as early as practical. Control dust during the storage and handling of dusty materials by wetting, covering, or other means as approved by Engineer.
3. When cutting through concrete, care should be exercised to prevent dust from becoming air borne.

Contractor must use an engineering control such as the use of a wet saw or dust collector. Engineer shall have the final determination when in a particular circumstance this is not feasible, and the concrete must be cut dry.

4. No separate item for dust control measures is included for payment in this Contract. Contractor must consider the cost of any dust control measures that is necessary for the proper construction of the Project as included in the Contract price for items of work for which dust control measures are required.

S. Dredging and Filling

1. Section 370.033, F.S., requires that all persons, who engage in certain dredge or fill activities in the State of Florida, obtain a certificate of registration from the Florida Department of Environmental Protection, Tallahassee, Florida 32301, and that they keep accurate logs and records of all such activities for the protection and conservation of the natural resources. Obtain details as to the application of this law from the Department of Environmental Protection and contact local regulatory agencies for additional applicable requirements.

T. Contractor's Motor Vehicle Registration

1. Provide the Department with proof that all motor vehicles operated or caused to be operated by such Contractor are registered in compliance with Chapter 320, F.S. Submit such proof of registration in the form of a notarized affidavit to the Department.
2. The Department will not make payment to Contractor until the required proof of registration is on file with the Department.

U. Compliance with FHWA 1273:

1. For federally funded projects and when required by law, comply with the provisions contained in FHWA-1273.
2. The FHWA-1273 Electronic version, dated July 5, 2022 is posted on the FDOT's website at the following URL address:
<https://www.fhwa.dot.gov/programadmin/contracts/1273/1273.pdf>.
3. Take responsibility to obtain this information and comply with all requirements posted on this website up through five calendar days before the opening of bids.
4. If the FDOT website cannot be accessed, contact FDOT Department's Specifications Office Web Coordinator at (850) 414-4101.

V. Sustainable Building / Infrastructure Program (As Applicable)

1. Projects that involve the planning, design, construction, management, renovation, maintenance and decommissioning of infrastructure or buildings owned, financed, or operated by the County shall

comply with the requirements of the County's Sustainable Buildings Program. All activity as a result of this contract shall comply with Chapter 2, Article I, Sec. 2-1, Rules 5.09 through 5.10, and Chapter 9, Article III, Sec. 9-71 through 9-75, and Implementing Order(IO) 8-8 of the Code of Miami-Dade County which established a County policy to incorporate, wherever practical, Green Building Practices. These sections of the code, together with the IO, are referred to as the Sustainable Buildings Program

2. The primary mechanisms for determining compliance with the Sustainable Buildings Program shall be the current LEED rating system (for Buildings) and the Envision rating system (for Infrastructure), except as noted elsewhere in IO 8-8. If an alternative rating system is requested to demonstrate compliance, substitutions of standard, compliance interpretations, and exemptions may be sought, as detailed in IO 8-8. Compliance shall be determined by completing a formal certification process with the U.S. Green Building Council, or as otherwise directed by the County's Sustainability Manager.
3. If the project is a building that is a Public Project:
 - a. For all New Construction Public Projects, the minimum rating shall be LEED Silver in the version most recently adopted by USGBC for all project phases, and the Section VII Prescriptive Path elements shall be required. Except as provided in IO 8-8 Section VI(A)(3).
 - b. For Public Projects that are not New Construction but meet LEED prerequisites, the minimum rating shall be LEED Silver in the version most recently adopted by USGBC for all project phases, and the Section VII Prescriptive Path elements shall be required. Except as provided in IO 8-8 Section VI(A)(3).
 - c. For Public Projects that are not New Construction and do not meet LEED prerequisites as determined by the Sustainability Manager, the Public Project shall adhere to Maximum Measures, and the IO 8-8 Section VII Prescriptive Path elements shall be required. Except as provided in IO 8-8 Section VI(A)(3).
4. If the project is a for infrastructure that is a Public Project:
 - a. For Infrastructure Public Projects that are subject to this IO with project costs greater than two million dollars (\$2,000,000), the minimum rating shall be Envision Silver, per the version most recently adopted by the Institute for Sustainable Infrastructure, and the required Section VII Prescriptive Path elements in I.O. 8-8.
 - b. For Infrastructure Public Projects with project costs less than two million dollars (\$2,000,000), the following requirements shall be met per I.O. 8-8:
 - 1) Maximum Measures

2) Section VII Prescriptive Path elements

1.06 PROSECUTION AND PROGRESS

A. Subletting Or Assigning The Contract

1. Do not, sell, transfer, assign or otherwise dispose of the Contract or Contracts or any portion thereof, or of the right, title, or interest therein, without written consent of the Department. If the Contractor chooses to sublet any portion of the Contract, the Contractor must provide a written request to sublet work on the Certification of Sublet Work form developed by the Department for this purpose.
2. Contractor must perform, with its own organization, contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the Contract Documents) of the total original contract price, excluding any specialty items designated by the County. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization.
 - a. "Its own organization" is construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" is construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
3. The contract amount, upon which the requirements set forth in this Subarticle is computed, includes the cost of material and manufactured products which are to be purchased or produced by the Contractor under the provisions of the Contract. For the purpose of meeting this requirement the Department will not consider off-site commercial production of materials and manufactured component products that the Contractor purchases, or their transportation to the project, as subcontracted work.
4. If the Contractor sublets a part of a Contract item, the Department will use only the sublet proportional cost in determining the percentage of subcontracted normal work.
5. Execute all agreements to sublet work in writing and include all pertinent provisions and requirements of the Contract. All other agreements must be in writing and reference all applicable Contract provisions. Upon request, furnish the Department with a copy of the subcontract and agreement. The subletting of work

does not relieve the Contractor or the surety of their respective liabilities under the Contract.

6. The Department recognizes a subcontractor only in the capacity of an employee or agent of the Contractor, and the Engineer may require the Contractor to remove the subcontractor as in the case of an employee.
7. Contractor must furnish:
 - a. A competent superintendent or supervisor who is employed by its firm, has full authority to direct performance of the Work in accordance with the Contract requirements, and is in charge of all construction operations (regardless of who performs the work); and
 - b. Such other of its own organizational resources (supervision, management, and engineering services) as the Engineer determines is necessary to assure the performance of the Contract.

B. Notice to Proceed

1. Unless otherwise agreed to by the parties, the Department may issue the Notice to Proceed (NTP) within 30 Days after all conditions for Contract execution have been met. The NTP will identify the date Contractor is to begin the construction and will start the Contract Time.

C. Project Signs

1. Project Signs will be provided by Miami-Dade County Internal Services Department (ISD) at no cost to Contractor.
2. The type, location, and number of signs required per each work site shall be at the discretion of Engineer.
3. No work shall commence until the Project Signs are secured in place as directed by Engineer.
4. Maintain and Relocate Project Signs.
 - a. Maintain and relocate Project Signs throughout the duration of the Contract, as directed by Engineer and at no additional cost to Miami-Dade County.
 - b. Install relocated Project Signs as required by Engineer. All materials and work necessary to secure, brace, mount, place, and maintain the Project Signs will be provided at Contractor's expense.
 - c. Notify Engineer immediately if at any time, during the Contract duration, a Project Sign becomes damaged, defaced, or unreadable. If Engineer determines that a replacement sign is required, Engineer will request it from ISD.
5. Upon completion of the Contract or at any time as directed by Engineer, deliver all available Project Signs to the designated ISD facility.
6. No separate payment will be made for the activities described above.

D. Schedule Of Values

1. A Schedule of Values is required for any Stipulated (Lump) sum contract, or for major lump sum items on Unit price contracts for which Contractor requests progress payments.
2. Upon notification of intent to Award and prior to the Notice to Proceed, submit to Engineer for review and approval, a preliminary Schedule of Values that:
 - a. Logically subdivides the Work into component parts with sufficient detail to serve as the basis for progress payments during performance of the Work and correlates to the Work Progress Schedule.
 - b. Includes quantities and prices of items for all of the Work which when added together equal either the Contract Base Award Amount for a Stipulated sum contract or the Contract Price for a major lump sum item in a Unit price contract.
 - c. Separately identifies the scope of work to be performed by any SBE-CONST utilized to satisfy any SBE-CONST goal in the Contract. In addition, payment requisitions for the scope of work of such SBE-CONST shall be accompanied by the statements of completion of the work of the SBE-CONST and shall be accompanied by appropriate documentation including invoicing and checks reflecting payment of the SBE-CONST for the previous construction draw.
3. The Schedule of Values for a Stipulated sum contract will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Base Award Amount to component parts of the Work.
4. When directed by Engineer, submit at least 10 days prior to the next application for progress payment, a revised or updated Schedule of Values to address any changes in the Work.

E. Preconstruction Conference

1. A Preconstruction Conference will be held with Contractor, members of the Department and other Miami-Dade County Agencies, representative of Utility Companies, and other municipalities or contractors affected by the Work. The Department will set the time and place of this conference.
2. Submit the following items to Engineer at the Preconstruction Conference unless otherwise noted:
 - a. Two copies of the proposed Work Progress Schedule. (Provide an updated schedule within 5 days of each Work Order for work order contracts.)
 - b. Contractor's Chain of Authority.
 - c. Contractor's Emergency Telephone Numbers, during work hours, after hours, and on weekend, of Prime and MOT Contractor's Representatives.

- d. Letter naming Contractor's Superintendent and his qualifications.
- e. Letter naming Contractor's Work Site Traffic Supervisor and a copy of their respective Certification(s).
- f. Letter naming Contractor's MOT Flagmen and a copy of their training Certification(s).
- g. Maintenance of Traffic Plan: Letter outlining the Specific Maintenance of Traffic Plan or Plans that will be used during construction. If the MOT plan is noted in the Construction Plans, it will be for reference only. Contractor is responsible to provide his own MOT Plan. MOT plans must be submitted within 5 days of the date of each Work Order for work order contracts.
- h. Shop drawing submittal schedule. To be submitted within 5 days of the date of each Work Order for work contracts.
- i. List of potential subcontractors and rental agreements.
- j. Letter listing the material providers for this project, with the respective name and address; and letter certifying the compliance of the material with the project requirements.
- k. List of equipment to be utilized for construction; including make, model, year, name and description of equipment.
- l. Contractor's Erosion Control Plan (ECP) pursuant to the requirements of the Contract Documents.
- m. Lighting plan if Contractor intends to perform any night work.
- n. All other submittal requirements stipulated in the Contract Documents.

F. Scheduling of the Work

1. Work Progress Schedule.

- a. Within 21 days after Contract award or at the Preconstruction Conference, whichever is earlier, submit to Engineer for approval two copies of a Work Progress Schedule for this Project. Engineer will review and respond to Contractor within 15 days of receipt.
- b. The Work progress Schedule must show the various activities of work in sufficient detail to demonstrate a reasonable and workable plan to initiate, construct, and complete all requirements of the Contract Documents within the Contract Duration and must:
 - 1) Include a projected Project completion, measured in dollars and time, on a monthly basis or at each progress payment cutoff date.
 - 2) Identify a date for substantial completion with "sufficient time" between substantial completion and end of Contract Duration for final inspections, final roadway striping if required, development of a

punch list by the Engineer, completion of all punch list items by Contractor, final submittals, and any remaining site restoration activities. "Sufficient time," as it pertains solely to this requirement, means no less than 60 days unless otherwise required by the Contract Documents or approved in writing by Engineer.

- 3) Include the order and interdependence of activities and the sequence for accomplishing the Work including phased restoration of areas impacted by work.
- 4) Describe activities in sufficient detail so that the Engineer can readily identify the Work and measure the progress of each activity.
- 5) Show each activity with a beginning work date, activity duration, and a monetary value.
- 6) Include within the activities the necessary steps for procurement, fabrication, and delivery of materials, plant, and equipment.
- 7) Include the review time for shop drawings and submittals.
- 8) Include the Critical Path and milestone activities when milestones are required by the Contract Documents.
- 9) In projects with more than one phase, adequately identify each phase and its substantial completion date, and do not allow phase specific activities to span more than one phase.

- c. Submit with the Work Progress Schedule a narrative report describing current project schedule status and identifying potential delays. This report will include a description of the progress made since the previous schedule submission and objectives for the upcoming 30 calendar days. It will be submitted on 8.5 by 11 inch paper. This report shall at a minimum include the following information:

- 1) Indicate if the Project is on schedule, ahead of schedule or behind schedule. If the Project is ahead of schedule or behind schedule, the report shall include the specific number of calendar days. If the Project is behind schedule, the report shall include a detailed recovery plan that will put the Project back on schedule.
- 2) The report will describe the current critical path of the Project and indicate if this has changed in the last 30 calendar days. Discuss current successes or problems that have affected either the critical path's length or have caused a

shift in the critical path within the last 30 calendar days. Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path.

- 3) List all schedule logic or duration changes that have been made to the schedule since the previous submission. For each change, describe the basis for the change and specifically identify the affected activities by identification number.
 - 4) Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require County participation, review, approval, etc.
- d. Submit, with the Work Progress Schedule, clear documentation demonstrating that all necessary coordination activities with utility owners that have facilities within the limits of construction have been conducted. In addition, incorporate into the work progress schedule any utility adjustment schedules included in the Contract Documents unless the utility company and the Department mutually agree to changes to the utility schedules shown in the Contract.
 - e. Engineer will return inadequate schedules to Contractor for corrections. Resubmit a corrected schedule within 15 days from the date of Engineer's return transmittal.
 - f. Submit an updated Work Progress Schedule, for Engineer's acceptance, if there is a significant change in the planned order or duration of an activity. Engineer will review the corrected schedule and respond within 7 days of receipt.
 - g. By acceptance of the schedule, Engineer does not endorse or otherwise certify the validity or accuracy of the activity durations or sequencing of activities. Engineer will use the accepted schedule as a baseline against which to measure the progress.
 - h. If Contractor fails to finalize either the initial or a revised schedule in the time specified, Engineer will withhold all Contract payments until Engineer accepts the schedule.

2. Weekly Work Progress Meetings:

- a. Coordinate weekly meetings to discuss Contract progress with Engineer including near term scheduled activities, utility relocations, and problems and their proposed solutions.
- b. Submit a Two-Week "Look Ahead" Planning Schedule at each weekly meeting, showing the items of work planned for the next two weeks. Develop the schedule in Bar Chart format, identifying current and planned activities and related Contract Schedule work

activities, including subcontractor work. Designate all activities that are controlling work items as determined by the currently accepted Contract Schedule.

- c. A report shall be submitted at each weekly meeting identifying schedule activity progress including actual start or finish dates achieved for any activities.

3. Prosecution of the Work.

- a. Give the Work the constant attention necessary to ensure the scheduled progress, and cooperate fully with Engineer and with other contractors at work in the vicinity.
- b. Do not commence work under the Contract until after the Department has issued the Notice to Proceed. Thereafter, commence the Work and continue all work in an expeditious manner to a conclusion acceptable to Engineer and in accordance with the approved Work Progress Schedule.
- c. All requirements of the Contract, including completion of punch list items and final deliverables, must be completed during the Contract Duration.
- d. Compliance with Time Requirements: Commence work in accordance with the approved Work Progress Schedule and provide sufficient labor, materials and equipment to complete all work as scheduled. Should Contractor fail to furnish sufficient and suitable equipment, forces, and materials, as necessary to prosecute the Work in accordance with the required schedule, Engineer may withhold all progress payments that are, or may become due, or suspend the work until Contractor corrects such deficiencies.
- e. Provisions for Convenience of Public: Schedule construction operations so as to minimize any inconvenience to adjacent businesses or residences. Where necessary, Engineer may require Contractor to first construct the work in any areas along the Project where inconveniences caused by construction operations would present a more serious handicap. In such critical locations, where there is no assurance of continuous effective prosecution of the work once the construction operations are begun, Engineer may require Contractor to delay removal of the existing (usable) facilities.
- f. The lack of equipment or unsuitability of said equipment shall not be an acceptable reason for falling behind schedule.
- g. If Contractor fails to complete all work under the Contract, within the time specified in the "Notice to Proceed" and/or Work Order(s), or fails to perform the Work with sufficient personnel and equipment or with sufficient materials to assure the prompt completion of the work assigned, or discontinues the prosecution of the Work, or fails to resume

work which has been discontinued within a reasonable time after notice to do so, or becomes insolvent or is declared bankrupt, or files for reorganization under the bankruptcy or insolvency code, or for any other cause whatsoever, fails to carry on the work in an acceptable manner, or if the surety executing the bond, becomes unsatisfactory in the opinion of the County, Engineer will give notice in writing to Contractor and his surety of such delay, neglect, or default. Additionally, the County may opt to not issue further Work orders and/or to terminate the Contract in addition to assigning a non-responsive Contractor Evaluation rating. Continuous failure by Contractor to complete work in a timely fashion may result in the County not issuing further work and/or cancellation of the Contract.

4. Additional Requirements for Work Order Contracts:

- a. The completion time for each Work Order will consist of a reasonable duration determined by Engineer.
- b. After the "Notice to Proceed" and issuance of the Work Order(s), Contractor shall commence the Work on the effective date of each Work Order and continue all work in an expeditious manner to a conclusion acceptable to Engineer.
- c. All activities required to be performed for each Work Order, including completion of punch list items and final deliverables, must be completed during the Work Order Days provided for each Work Order.
- d. Unless otherwise provided by the Contract Documents, Engineer may issue subsequent Work Order(s) any time after Engineer determines that work under an existing Work Order is substantially completed, even if site restoration or punch list items are pending for the existing Work Order.

G. Progress of the Work.

1. Unless otherwise stipulated herein, progress of the Work will be evaluated monthly and compared to the approved Work Progress Schedule.
 - a. When dollars invoiced by Contractor on the Project are 15 percent greater than the estimated dollars for the work scheduled, Engineer may request in writing, that Contractor submit a revised Work Progress Schedule for approval by the next scheduled monthly submittal date.
 - b. When the dollars earned by Contractor on the Project are 15 percent less than the estimated dollars for the work scheduled, Engineer may deem the progress of the Work unsatisfactory and will issue a notice to Contractor of unsatisfactory performance.
 - c. In the event a noncritical item becomes critical as determined by Engineer,

Contractor must submit a revised CPM schedule.

- d. When an activity on the critical path, as shown on the current approved Work Progress Schedule, has exceeded its late start date by 7 Days, Engineer will deem the progress of Work unsatisfactory and will hold a meeting with Contractor to address the schedule within 7 Days of the discovery. If a resolution cannot be determined within 5 Days, Engineer will issue a notice to Contractor of unsatisfactory performance.
 - e. When it becomes apparent that an activity on the critical path, as shown on the current approved Work Progress Schedule, has exceeded its original duration by 10 or more Days, regardless of the Contract's definition of Contract Time, Contractor must submit a revised Work Progress Schedule for approval within 5 Days of the discovery and Engineer will issue a notice of unsatisfactory performance to the Contractor and identify the unsatisfactory performance.
2. The notice of unsatisfactory performance will also allow a reasonable period of time, as determined by Engineer but not to exceed 30 Days from receipt of the notice, for Contractor to bring the progress of the Work into compliance with the current accepted work progress schedule or to provide acceptable written justification for the delay. Contractor must do the following things within the time specified in the notice to Contractor of unsatisfactory performance:
 - a. Submit a revised baseline progress schedule and recovery plan to Engineer for review and approval. Demonstrate the proposed method to complete the Project within the remaining time specified in the current accepted work progress schedule; and
 - b. If Contractor is unable to provide such a revised schedule, a late completion schedule shall be submitted indicating the time required to complete the Work. The Department's approval of the late completion schedule will not operate as a waiver of the Department's right to assess liquidated damages;
 - c. Take all necessary action, subject to Engineer's approval, to ensure completion of the Project at no additional cost to the Department within the remaining time specified in the accepted schedule. Actions may include but not be limited to the following:
 - 1) Additional overtime;
 - 2) Added work shift;
 - 3) Additional workforce;
 - 4) Extended workweek;
 - 5) Additional Equipment; or
 - 6) A combination of these.

H. Performance of Work

1. Give due and adequate notices to those in control of all properties that may be affected by the construction activities.
2. Keep on the job site sufficient plant and equipment to meet the requirements of the Work. The plant shall be kept in a satisfactory operating condition and be capable of safely and efficiently performing the Work as set forth in the Plans and Specifications. The equipment and all operations shall be subject to inspection by Engineer at all times.
3. Submit for approval by Engineer, a description of the type of materials and equipment to be used; and the method of procedure to be used in the performance of the Work.

4. Condition of Equipment

- a. All equipment used in the performance of the Work must be in first class operating condition, including proper mufflers and other silencing accessories. All equipment must be properly lubricated on a special maintenance type schedule to reduce noise, including tracks, rollers, idlers, sheaves and other noise producing components. Care must be taken to prevent oil spillage of any kind or oil dripping from equipment. All dewatering pumps and welding machines must be engine driven or powered by Contractor furnished generators. The temporary power source available at the jobsite is not sufficient to power that type of equipment.
- b. If the equipment used proves less than satisfactory and is unduly or needlessly disturbing the neighbors, in the opinion of Engineer, he will have the right to order Contractor to immediately modify the equipment to make it satisfactory, or to change to other equipment that is satisfactory at no additional cost to the County.

5. Saw Cutting:

- a. When required in performance of this Contract, material may be removed by either saw cutting the slab perpendicular to the long edge, or by any other means that will produce a clean neat cut and that is acceptable to Engineer. All costs for saw cutting and/or any other necessary means for accomplishing the bid items listed in this Contract shall be included in the cost for said item.

6. Open Excavations:

- a. At the close of each workday, Contractor shall refill all open excavations, or cover open excavations with steel plates capable of supporting vehicular traffic at no additional cost to the County.

7. Florida Trench Safety Act

- a. The Florida Trench Safety Act (Sections 553.60-553.64, Florida Statutes) is hereby

incorporated by reference and made a part of these Specifications. The purpose and intention of the State of Florida "Trench Safety Act" is to provide for increased worker safety by requiring compliance with sufficient standards for trench safety and providing additional specific requirements when the excavation is in excess of 5 feet deep. By executing the Contract, Contractor certifies that he is fully aware of the Trench Safety Act, and will comply with applicable trench safety standards.

- b. In accordance with Sections 553.60-553.64, F.S., the bidder acknowledges those included in the various items of the proposal and in the total bid price are costs for complying.

I. As-Built Drawings

1. Five (5) sets of complete "As-Built" drawings signed and sealed by either a Florida Registered Surveyor and Mapper or a Florida Registered Professional Engineer, shall be accurately recorded by Contractor and submitted to Engineer prior to final acceptance of the Work. As Built drawing required for Federally Funded Projects must be signed and sealed only by a Florida Registered Professional Engineer.
2. The As-Built Drawings must contain detailed information pertaining to the locations, spans, depths, and elevations of all significant elements of construction performed pursuant to the Contract Documents in addition to all information necessary to comply with Project permits and regulatory requirement.
3. All locations, depths, and elevations shall be taken by a Florida Registered Surveyor and Mapper and be shown on the As-Built drawings.
4. No separate payment will be made for the As-Built drawings.

J. Liquidated Damages

1. Contractor, or in case of his default the surety, shall pay to the County, not as a penalty but as liquidated damages, the amount stipulated below should Contractor fail to complete all work specified within the time stipulated in the Contract for substantial completion, including extra time granted in writing by the County. Substantial completion must be achieved 60 days prior to contract final acceptance, unless a different time is stipulated under contract duration on the Special Provisions. For Work Order based Contracts, liquidated damages shall be the amount stipulated below, computed for each Work Order, should Contractor fail to complete all work specified within the time stipulated in the Work Order, including extra time granted in writing by the County.
2. Applicable liquidated damages for each day after the scheduled substantial completion date are the amounts established in the following schedule:

Total Contract/Work Order Amount	Daily Charge Per Calendar Day
\$299,999 and under	\$980
\$300,000 but less than \$2,000,000	\$1,699
\$2,000,000 but less than \$5,000,000	\$2,650
\$5,000,000 but less than \$10,000,000	\$3,819
\$10,000,000 but less than \$20,000,000	\$4,687
\$20,000,000 but less than \$40,000,000	\$7,625
\$40,000,000 and over	\$10,467 plus 0.00005 of any amount over \$40 million (Round to nearest whole dollar)

3. Contractor, or in case of his default the surety, shall pay to the County, not as a penalty but as liquidated damages, 30% of the amount stipulated above under this Subarticle J.2 should Contractor fail to complete punch list items and deliver all required documents, including warranties, necessary to close out the project within the total time stipulated in the Contract for final acceptance, including extra time granted in writing by the County.
4. Engineer will count default days in calendar days.
5. County has the right to apply, as payment on such liquidated damages, any money the County owes Contractor.
6. County does not waive its right to liquidated damages due under the Contract by allowing Contractor to continue and to finish the work, or any part of it, after the expiration of the Contract/Work Order Time including granted time extensions.
7. The requirements of this Article may not be waived, compromised or settled without the express written consent of the Board of County Commissioners.

K. Limitations of Operations

1. General:

- a. Subject to any provision to the contrary provided in these Contract Documents, Work must not be carried out during the night or on Saturdays, Sundays or on County holidays without prior written approval from Engineer issued at least 72 hours before these times so that proper inspection and engineering services may be scheduled.
- b. Prior written approval from Engineer, as specified in this Article, is not required for the performance of work that is necessary for proper care, maintenance, and protection of Work already done, or in cases when the Work would otherwise be endangered or when hazard to life or property would result, in which case Contractor must inform

Engineer at the earliest possible opportunity of the same.

- c. All construction activities, designated by Engineer as requiring inspection by the County, must be scheduled to coincide with the hours of availability of Engineer or Engineer's duly authorized inspector. The hours of availability are from 7:00 AM until 4:30 PM Monday through Friday; unless otherwise approved by the Engineer, these construction activities must be scheduled to coincide with the aforementioned hours of availability.
- d. Work performed without the prior written approval of Engineer and without an Engineer's duly authorized inspector may be declared defective solely on the grounds that it was not properly inspected.
- e. In the event, that the Engineer approves work on night or on Saturdays, Sundays or on County holidays; the Contractor will be responsible to pay the overtime incurred during the approved overtime hours at the current inspector's hourly rate. Such payment will be deducted from the monthly invoice.
- f. Contractor must conform to all applicable laws, regulations, or ordinances with regard to labor employed, hours of work and general operations.

2. Night Work:

- a. Night work may be undertaken as a regular procedure when required by the Contract Documents or approved in writing by Engineer. Such approval, however, may be revoked at any time by Engineer if Contractor fails to maintain adequate equipment, lighting, and supervision for the proper prosecution and control of the Work at night pursuant to the requirements herein.
- b. For the purposes of this Article, the term "night" shall mean the period from 6:00 p.m. to 7:00 a.m. Due to traffic interference concerns, authorized night construction activities that may be disruptive to traffic flow can only be performed weekdays between 9:00 p.m. to 5:00 a.m.
- c. Prepare a specific work plan and submit it to the Engineer for approval at least one week in advance of the anticipated work. The plan must include a schedule of all activities of work and show in detail the special arrangements that will be made to provide for all regulatory and Contract requirements including cordoning off the areas with sufficient roadwork safety signs; providing approved MOT; worksite personnel and citizen safety; necessary lighting; and daily restoration of the work site.
- d. Obtain and comply with all necessary permits and authorizations from the applicable jurisdictions.

- e. Complete all scheduled work and restore the work site as required in the Engineer's approval.
- f. Lighting during nighttime operations:
 - 1) During active nighttime operations, furnish, place and maintain lighting sufficient to permit proper workmanship and inspection. Use lighting with 5 ft•cd minimum intensity. Arrange the lighting to prevent interference with traffic or produce undue glare to property owners. Operate such lighting only during active nighttime construction activities. Provide a light meter to demonstrate that the minimum light intensity is being maintained.
 - 2) Lighting may be accomplished by the use of portable floodlights, standard equipment lights, existing street lights, temporary street lights, or other lighting methods approved by Engineer.
 - 3) Submit a lighting plan at the Preconstruction Conference for review and acceptance by Engineer. Submit the plan on standard size plan sheets (not larger than 24 by 36 inch), and on a scale of either 100 or 50 feet to 1 inch. Do not start night work prior to the Engineer's acceptance of the lighting plan.
 - 4) During active nighttime operations, furnish, place and maintain variable message signs to alert approaching motorists of lighted construction zones ahead. Operate the variable message signs only during active construction activities.
 - 5) Where night work is required by the Contract Documents, include compensation for lighting for night work in the Contract prices for the various items of the Contract. Take ownership of all lighting equipment for night work.
- 3. Sequence of Operations: Do not open up work to the prejudice of work already started. Engineer may require Contractor to finish a section on which work is in progress before starting work on any additional section.
- 4. Interference with Traffic:
 - a. At all times conduct the Work in such manner and in such sequence as to ensure the least practicable interference with traffic. Operate all vehicles and other equipment safely and without hindrance to the traveling public. Park all private vehicles outside the clear zone. Place materials authorized to be stored along the roadway so as to cause no obstruction to the traveling public as possible.
 - b. Where existing pavement is to be widened and stabilizing is not required, prevent any open trench from remaining after working hours by scheduling operations to place the full thickness of widened base by the end of each day. Do not construct widening strips simultaneously on both sides of the road, except where separated by a distance of at least 1/4 mile along the road and where either the work of excavation has not been started or the base has been completed.
- 5. Coordination with other contractors:
 - a. Sequence the work and dispose of materials so as not to interfere with the operations of other contractors engaged upon adjacent work; join the work to that of others in a proper manner, in accordance with the spirit of the Contract Documents; and perform the work in the proper sequence in relation to that of other contractors; all as may be directed by Engineer.
 - b. Contractor is responsible for any damage done by him or his agents to the work performed by another contractor.
- 6. Drainage: Conduct the operations and maintain the work in such condition to provide adequate drainage at all times. Unless otherwise required by the Contract Documents, do not obstruct existing functioning storm drains, gutters, ditches, and other run-off facilities.
- 7. Fire Hydrants: Keep fire hydrants on or adjacent to the roadway accessible to fire apparatus at all times, and do not place any material or obstruction within 15 feet of any fire hydrant.
- 8. Protection of Structures: Do not operate heavy equipment close enough to pipe headwalls or other structures to cause their displacement.
- 9. Fencing: Erect permanent fence as a first order of business on all projects that include fencing where Engineer determines that the fencing is necessary to maintain the security of livestock on adjacent property, or for protection of pedestrians who are likely to gain access to the project from adjacent property.
- 10. Contaminated Materials:
 - a. When the construction operations encounter or expose any abnormal condition that may indicate the presence of a contaminated material, discontinue such operations in the vicinity of the abnormal condition and notify Engineer immediately. Be alert for the presence of tanks or barrels; discolored earth, metal, wood, ground water, etc.; visible fumes; abnormal odors; excessively hot earth; smoke; or other conditions that appear abnormal as possible indicators of the presence of contaminated materials. Treat these conditions with extraordinary caution.
 - b. Make every effort to minimize the spread of Contaminated Material into uncontaminated areas.
 - c. Do not resume the construction operations until so directed by Engineer.
 - d. Dispose of the Contaminated Material in accordance with the requirements and

regulations of any Local, State, or Federal agency having jurisdiction. Where Contractor performs work necessary to dispose of Contaminated material, and the Contract does not include pay items for disposal, the Department will pay for this work as unforeseeable work.

- e. The Department may agree to hold harmless and indemnify Contractor for damages when Contractor discovers or encounters Contaminated materials or pollutants during the performance of services for the Department when the presence of such materials or pollutants were unknown or not reasonably discoverable. Such indemnification agreements are only effective if Contractor immediately stops work and notifies the Department of the Contaminated material or pollutant problem.
- f. Such indemnification agreement is not valid for damages resulting from Contractor's willful, wanton, or intentional conduct or the operations of Contaminated and Hazardous Material Contractors.

L. Qualifications of Contractor's Personnel

1. Meet the personnel qualifications requirements stipulated in Article 105 of the DTPW Specifications.
2. Provide competent, careful, and reliable superintendents, foremen, and workmen. Provide workmen with sufficient skill and experience to properly perform the work assigned to them. Provide workmen engaged on special work, or skilled work, such as bituminous courses or mixtures, concrete bases, pavements, or structures, or in any trade, with sufficient experience in such work to perform it properly and satisfactorily and to operate the equipment involved. Provide workmen that shall make due and proper effort to execute the work in the manner prescribed in the Contract Documents, or Engineer may take action as prescribed below.
3. It is prohibited as a conflict of interest for a Contractor to subcontract with a Consultant to perform Contractor Quality Control when the Consultant is under contract with the Department to perform work on any project described in Contractor's Contract with the Department. Prior to approving a Consultant for Contractor Quality Control, Contractor shall submit to the Department a Certificate from the proposed Consultant certifying that no conflict of interest exists.
4. Whenever Engineer determines that any person employed by Contractor is incompetent, unfaithful, intemperate, disorderly, or insubordinate, Engineer will provide written notice and Contractor shall discharge the person from the work. Do not employ any discharged person on the Project without the written consent of Engineer. If Contractor fails to remove such person or persons, Engineer may withhold all payments that are or may become due, or suspend the work until Contractor complies with such orders. Protect, defend, indemnify, and hold the County, its agents, officials, and employees harmless from all

claims, actions, or suite arising from such removal, discharge, or suspension of employees.

M. Temporary Suspension of Contractor's Operations

1. Authority to Suspend Contractor's Operations:

- a. Engineer has the authority to suspend Contractor's operations, wholly or in part. Engineer will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations.
- b. Any work in the public right of way may be temporarily suspended by the roadway governing authority. If an extension of Contract time is authorized pursuant to the requirements of the Contract Documents, it will be of a non-compensable nature. All costs associated with temporary suspension including any demobilization or re-mobilization costs are the sole responsibility of the Contractor and no extra compensation will be allowed.
- c. No additional time extension will be granted to Contractor when the operations are suspended for the following reasons:
 - 1) Contractor fails to comply with the Contract Documents.
 - 2) Contractor fails to carry out orders given by Engineer.
 - 3) Contractor causes conditions considered unfavorable for continuing the Work.
- d. Immediately comply with any suspension order. Do not resume operations until authorized to do so by Engineer in writing. Any operations performed by Contractor, and otherwise constructed in conformance with the provisions of the Contract, after the issuance of the suspension order and prior to Engineer's authorization to resume operations will be at no cost to the County. Further, failure to immediately comply with any suspension order will also constitute an act of default by Contractor and is deemed sufficient basis in and of itself for the Department to declare Contractor in default, with the exception that Contractor will not have ten calendar days to correct the conditions for which the suspension was ordered.

2. Prolonged Suspensions: If Engineer suspends Contractor's operations for an indefinite period, store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily or become damaged in any way. Take every reasonable precaution to prevent damage to or deterioration of the work performed. Provide suitable drainage of the roadway by opening ditches, shoulder drains, etc., and

provide any temporary structures necessary for public travel through the project.

3. Permission to Suspend Contractor's Operations: Do not suspend operations or remove equipment or materials necessary for completing the work without obtaining Engineer's written permission. Submit all requests for suspension of operations in writing to Engineer, and identify specific dates to begin and end the suspension. Contractor is not entitled to any additional compensation for suspension of operations during such periods.
4. Suspension of Contractor's Operations-Holidays:
 - a. Unless Contractor submits a written request to work on a holiday at least ten days in advance of the requested date and receives written approval from Engineer, Contractor must not work on the following days: Martin Luther King, Jr. Day; President's Day, Memorial Day; the Saturday and Sunday immediately preceding Memorial Day; Independence Day; Labor Day; the Saturday, and Sunday immediately preceding Labor Day; Columbus Day, Veterans' Day; Thanksgiving Day; the Friday, Saturday and Sunday immediately following Thanksgiving Day; and December 24 through January 2, inclusive. Contract Time will be charged during these holiday periods regardless of whether or not Contractor's operations have been suspended.
 - b. During such suspensions, remove all equipment and materials from the clear zone, except those required for the safety of the traveling public and retain sufficient personnel at the job site to properly meet all applicable requirements for: (1) Maintenance of Traffic; and (2) Prevention, Control, and Abatement of Erosion and Water Pollution. Contractor is not entitled to any additional compensation for removal of equipment from clear zones or for compliance with the aforementioned requirements during such holiday periods.

N. Computation of Contract Time

1. Date of Beginning of Contract Time: The Contract Time begins on the effective start date of the "Notice to Proceed." Perform the Work fully, entirely, and in accordance with the Contract Documents within the Contract Time(s) specified in the Contract Documents, or as may be extended in accordance with the provisions herein.
2. Contract Time Extensions:
 - a. The Department will consider the delays in delivery of materials or component equipment that affect progress on a controlling item of work as a basis for granting a time extension if such delays are beyond the control of Contractor or supplier. Such delays may include an area-wide shortage, an industry-wide strike, or a natural disaster

that affects all feasible sources of supply. In such cases, Contractor shall furnish substantiating letters from a representative number of manufacturers of such materials or equipment clearly confirming that the delays in delivery were the result of an area-wide shortage, an industry-wide strike, etc. No additional compensation will be made for delays caused by delivery of materials or component equipment.

- b. The Department will not consider requests for time extension due to delay in the delivery of custom manufactured equipment including traffic signal equipment, highway lighting equipment, etc., unless Contractor furnishes documentation that the order for such equipment was placed in a timely manner, the delay was caused by factors beyond the manufacturer's control, and the lack of such equipment caused a delay in progress on a controlling item of work. No additional compensation will be paid for delays caused by delivery of custom manufactured equipment.
- c. The Department will consider the effect of utility relocation and adjustment work on job progress as the basis for granting a time extension only if all the following criteria are met:
 - 1) Delays are the result of either utility work that was not detailed in the plans, or utility work that was detailed in the plans but was not accomplished in reasonably close accordance with the schedule included in the Contract Documents.
 - 2) Utility work actually affected progress toward completion of controlling work items.
 - 3) Contractor took all reasonable measures to minimize the effect of utility work on job progress, including cooperative scheduling of Contractor's operations with the scheduled utility work at the preconstruction conference and providing adequate advance notification to utility companies as to the dates to coordinate their operations with Contractor's operations to avoid delays.
- d. As a condition precedent to an extension of Contract Time, Contractor must submit to Engineer:
 - 1) A preliminary request for an extension of Contract Time made in writing to Engineer within ten calendar days after the commencement of a delay to a controlling item of work. If Contractor fails to submit this required preliminary request for an extension of Contract Time, Contractor fully, completely, absolutely and irrevocably waives any entitlement to an extension of Contract Time for that delay. In the case of a

continuing delay only a single preliminary request for an extension of Contract Time will be required. Each such preliminary request for an extension of Contract Time shall include as a minimum the commencement date of the delay, the cause of the delay, and the controlling item of work affected by the delay; and

- 2) Further, Contractor must submit to Engineer a request for a Contract Time extension in writing within 30 days after the elimination of the delay to the controlling item of work identified in the preliminary request for an extension of Contract Time. Each request for a Contract Time extension shall include as a minimum all documentation that Contractor wishes the Department to consider related to the delay, and the exact number of days requested to be added to Contract Time. If Contractor contends that the delay is compensable, then Contractor is also required to submit with the request for a Contract Time extension a detailed cost analysis of the requested additional compensation. If Contractor fails to submit this required request for a Contract Time extension, with or without a detailed cost analysis, depriving Engineer of the timely opportunity to verify the delay and the costs of the delay, Contractor waives any entitlement to an extension of Contract Time or additional compensation for the delay.
- e. Upon timely receipt of the preliminary request of Contract Time from Contractor, Engineer will investigate the conditions, and if it is determined that a controlling item of work is being delayed for reasons beyond the control of Contractor, Engineer will take appropriate action to mitigate the delay and the costs of the delay. Upon timely receipt of the request for a Contract Time extension Engineer will further investigate the conditions, and if it is determined that there was an increase in the time or the cost of performance of the controlling item of work beyond the control of Contractor, then an adjustment of Contract Time will be made, and a monetary adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly.
- f. The existence of an accepted schedule, including any required update(s), as required by the Contract Documents is a condition precedent to Contractor having any right to the granting of an extension of contract time or any monetary compensation arising out of any delay. Contractor failure to have an accepted schedule, including any required update(s), for the period of potential impact, or in the event the currently accepted

schedule and applicable updates do not accurately reflect the actual status of the project or fail to accurately show the true controlling or non-controlling work activities for the period of potential impact, will result in any entitlement determination as to time or money for such period of potential impact being limited solely to the Department's analysis and identification of the actual controlling or non-controlling work activities. Further, in such instances, the Department's determination as to entitlement as to either time or compensability will be final.

O. Default and Termination of Contract

1. Determination of Default:

- a. The following acts or omissions constitute acts of default and, except as to subparagraph 10) below, the Department will give notice, in writing, to Contractor and his surety for any delay, neglect or default, if Contractor:
 - 1) Fails to begin the work under the Contract within the time specified in the Notice to Proceed;
 - 2) Fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure prompt completion of the Contract;
 - 3) Performs the work unsuitably, or neglects or refuses to remove materials or to perform anew such work that Engineer rejects as unacceptable and unsuitable;
 - 4) Discontinues the prosecution of the work, or fails to resume discontinued work within a reasonable time after Engineer notifies Contractor to do so;
 - 5) Becomes insolvent or is declared bankrupt, or files for reorganization under the bankruptcy code, or commits any act of bankruptcy or insolvency, either voluntarily or involuntarily;
 - 6) Allows any final judgment to stand against him unsatisfied for a period of ten calendar days;
 - 7) Makes an assignment for the benefit of creditors;
 - 8) Fails to comply with Contract requirements regarding minimum wage payments;
 - 9) Fails to comply with Engineer's written suspension of work order within the time allowed for compliance and which time is stated in that suspension of work order; or
 - 10) For any other cause whatsoever, fails to carry on the work in an acceptable

manner, or if the surety executing the bond, for any reasonable cause, becomes unsatisfactory in the opinion of the Department.

- b. For a notice based upon reasons stated in subparagraphs a. 1) through 8) and 10) above: if Contractor, within a period of ten calendar days after receiving the notice described above, fails to correct the conditions of which complaint is made, the Department will, upon written certificate from Engineer of the fact of such delay, neglect, or default and Contractor's failure to correct such conditions, have full power and authority, without violating the Contract, to take the prosecution of the work out of the hands of Contractor and to declare Contractor in default.
- c. If Contractor, after having received a prior notice described above for any reason stated in subparagraph a. 2), 3), 4), 5), 6) or 8), commits a second or subsequent act of default for any reason covered by the same subparagraph a. 2), 3), 4), 5), 6) or 8) as stated in the prior notice, and regardless whether the specific reason is the same, then, regardless of whether Contractor has cured the deficiency stated in that prior notice, the Department will, upon written certificate from Engineer of the fact of such delay, neglect or default and Contractor's failure to correct such conditions, have full power and authority, without any prior written notice to Contractor and without violating the Contract, to take the prosecution of the work out of the hands of Contractor and to declare Contractor in default.
- d. Regarding subparagraph a. 9), if Contractor fails to comply with Engineer's written suspension of work order within the time allowed for compliance and which time is stated in that suspension of work order, the Department will, upon written certificate from Engineer of the fact of such delay and Contractor's failure to correct that condition, have full power and authority, without violating the Contract, to immediately take the prosecution of the work out of the hands of Contractor and to declare Contractor in default.
- e. The Department has no liability for anticipated profits for unfinished work on a Contract that the Department has determined to be in default.

2. Completion of Work by Department:

- a. Upon declaration of default, the Department will have full power to appropriate or use any or all suitable and acceptable materials and equipment on the site and may enter into an agreement with others to complete the work under the Contract, or may use other methods to complete the work in an acceptable manner. The Department will

charge all costs that the Department incurs because of Contractor's default, including the costs of completing the work under the Contract, against Contractor. If the Department incurs such costs in an amount that is less than the sum that would have been payable under the Contract had the defaulting Contractor completed the work then the Department will pay the difference to the defaulting Contractor. If the Department incurs such costs in an amount that exceeds the sum that would have been payable under the Contract, then Contractor and the surety shall be liable and shall pay the County the amount of the excess.

- b. If, after the ten day notice period and prior to any action by the Department to otherwise complete the work under the Contract, Contractor establishes his intent to prosecute the work in accordance with the Department's requirements, then the Department may allow Contractor to resume the work, in which case the Department will deduct from any monies due or that may become due under the Contract, any costs to the County incurred by the delay, or from any reason attributable to the delay.

3. Termination of Contract for Convenience:

- a. The Department may terminate the entire Contract or any portion thereof, if the Department determines termination is in the County's interest. Engineer will deliver to Contractor a Written Notice of Termination specifying the extent of termination and the effective date.
- b. When the Department terminates the entire Contract, or any portion thereof, before Contractor completes all items of work in the Contract, the Department will make payment for the actual number of units or items of work that Contractor has completed, at the Contract unit price, and as approved by Engineer for items of work partially completed, and such payments will constitute full and complete compensation for such work or items. No payment of any kind or amount will be made for items of work not started. The Department will not consider any claim for loss of anticipated profits, or overhead of any kind (including home office and jobsite overhead or other indirect impacts).
- c. The Department will consider reimbursing Contractor for actual cost of mobilization (when not otherwise included in the Contract) including moving equipment to the job where the volume of the work that Contractor has completed is de minimis and thereby too small to compensate Contractor for these expenses under the Contract unit prices.
- d. The Department may purchase at actual cost acceptable materials and supplies procured for the work, that the Department has

inspected, tested, and approved and that Contractor has not incorporated in the work. Submit the proof of actual cost, as shown by receipted bills and actual cost records, at such points of delivery as Engineer may designate.

- e. Termination of a contract or a portion thereof, under the provisions of this Subarticle, does not relieve Contractor or the surety of its responsibilities for the completed portion of the Contract or its obligations for and concerning any just claims arising out of the work performed.

P. Release of Contractor's Responsibility

The Department considers the Contract complete when Contractor has completed all work and requirements of the Contract and the Department has accepted the Work. The Department will then release Contractor from further obligation except as set forth in the Contract Bonds, and except as allowed by the Contract Documents subsequent to Final Payment.

1.07 MEASUREMENT AND PAYMENT

A. Compensation

1. Compensation provided by the Contract, through the various scheduled items having awarded Contract Unit Prices, constitutes full payment for completing the Work and meeting all requirements of the Contract Documents. Approved payments will be made only under items having awarded Contract Unit Prices that are measured and accepted by Engineer.
2. The aforementioned compensation includes:
 - a. Full payment for furnishing any material, supply, equipment, tool, labor, supervision, or meeting any requirement that is reasonably inferred or incidental to the Work whether or not specifically called for by the Contract Documents.
 - b. Items of work that do not have awarded Contract Unit Prices, even if the items appear within the Articles of these Specifications or anywhere else in the Contract Documents. These items will not be measured separately for payment. Compensation for performing any work or meeting any requirement associated with these items is included in approved payments made under the various scheduled items having awarded Contract Unit Prices.
3. For Job Order Contracts, the Contract Unit Price, where referenced anywhere in these Contract Documents, is the price which results from the multiplication of the unit price provided by the County on the Project Bid Form times the awarded Contractor's percentage factor. All compensation for services called for in this Contract shall be made on the basis of the Contract Unit Prices for quantities based upon the actual work performed and accepted

by Engineer. Such compensation shall be complete payment for all phases of the operation and no additional payment shall be made for any reason whatsoever.

4. Miami-Dade County offers a payment option that will expedite County payments to your organization via Automatic Clearing House transfers instead of the issuance and mailing of a County check. More information is available at <http://www.miamidade.gov/finance/vendor-payment.asp#5> The form can also be found on the Appendices to the Special Provisions

B. Contingency Allowance Account

1. A Contingency Allowance account has been established for the Work under this Contract. The Total Contract award amount will include no more than ten percent (10%) Contingency Allowance Account. Contractor is not entitled to funds from the Contingency Allowance Account unless, at the discretion of Engineer, work is directed to be performed that is beyond the scope of established pay items. Contractor shall perform such work only upon receipt of an executed Miami-Dade-County Contingency Allowance Account expenditure form from Engineer.

C. Florida Power And Light Connection Allowance

1. County will reimburse Contractor, at invoice cost, for the services of the Florida Power and Light (FPL) connection fees required by Engineer. The necessary invoices shall be submitted to Engineer for inclusion in the payment requisition. This payment will be made from the appropriate dedicated allowance. If no dedicated allowance is provided, then payment shall be made from the Contingency Allowance Account.

D. Retainage; Punch List Requirements

1. Amount of retainage.
 - a. An amount of 5-percent retainage will be withheld from each progress payment made to Contractor.
2. Project closeout (Punch List).
 - a. Within 21 days of reaching Substantial Completion and performance of required inspection(s), Engineer, with cooperation of Contractor, will develop a single punch list subject to the provisions of Section 218.735 (7) of the Florida Statutes (F.S.), listing all items necessary to render complete, satisfactory, and acceptable to Engineer all work and requirements of the Contract. Contractor will review and comment as necessary to assist Engineer in the preparation of the final draft of the list during the aforementioned timeframe.
 - b. Engineer will provide Contractor with the Punch List within 5 days after the List has been developed and reviewed as provided in

Subarticle 2.a above. Contractor must immediately work on completion of the items listed and provide to Engineer within 5 days of receipt of the Punch List, a final schedule for the completion of all pending work and requirements of the Contract. The schedule must provide for the final completion of all Contract requirements and acceptance by the Engineer prior to the expiration of the Contract.

c. For work order or multiphase projects:

- 1) Provide a punch list listing all items necessary to render complete, satisfactory, and acceptable to Engineer all work and requirements for each phase or work order as applicable.
- 2) All time limitations and requirements stipulated above apply except that the timeframe requirements for the individual punch lists are based on the specific phase or work order's substantial completion.

3. Release of Retainage.

a. The release of retainage is subject to Section 218.735 (7), F.S. and may be requested as follows:

- 1) Upon completion of all items on the punch list and their acceptance by Engineer, Contractor may submit a payment request for all remaining retainage withheld by the County
- 2) under this Contract. If a good faith dispute exists as to whether one or more items identified on the Punch List have been completed pursuant to the Contract requirements, the County may continue to withhold an amount equal to 150 percent of the total costs to complete such items.
- 3) The County is not required to pay or release any amounts of retainage that are the subject of a good faith dispute, the subject of a claim brought pursuant to Section 255.05, F.S., or otherwise the subject of a claim or demand by the County or Contractor.

E. Measurement of Quantities

1. Measurement Standards: Engineer will measure all work completed under the Contract in accordance with the United States Standard Measures.
2. Method of Measurements: Engineer will take all measurements horizontally or vertically as applicable.
3. Determination of Pay Areas:
 - a. Final Calculation: When measuring items paid for on the basis of area of finished work, where the pay quantity is designated to be determined by calculation, Engineer will use

lengths and widths in the calculations based on the station to station dimensions shown on the plans; the station to station dimensions actually constructed within the limits designated by Engineer; or the final dimensions measured along the surface of the completed work within the neat lines shown on the Plans or designated by Engineer. Engineer will use the method or combination of methods of measurement that reflect, with reasonable accuracy, the actual surface area of the finished work as Engineer determines.

4. Construction Outside Authorized Limits: Engineer will not pay for surfaces constructed over a greater area than authorized, or for material that Contractor has moved from outside of slope stakes and lines shown on the plans, except where Engineer provides written instruction for Contractor to perform such work.
5. Truck Requirements: Provide all trucks with numbers and certify that all trucks used have a manufacturer's certification or permanent decal showing the truck capacity rounded to the nearest tenth of a cubic yard placed on both sides of the truck. This capacity will include the truck body only and any side boards added will not be included in the certified truck body capacity. Ensure the lettering and numbers are legible for identification purposes at all times.
6. Ladders and Instrument Stands for Bridge Projects:
 - a. On bridge projects, in order to facilitate necessary measurements, provide substantial ladders to the tops of piers and bents, and place and move such ladders as Engineer directs.
 - b. For bridge projects crossing water or marshy areas, supply fixed stands for instrument mounting and measurements, in accordance with the details stipulated in the Specifications for the project.

F. Fuel Adjustment

1. DTPW will, in the Contract Documents, provide an estimated quantity for fuel requirements for diesel to cover the Work specified in the Contract. Price adjustments will be made only for the amount of diesel fuel estimated by the DTPW required to complete the Contract. The requirement of fuel for each pay item is estimated by multiplying FDOT's standard fuel factor for that pay item by the quantity of that pay item. On Contracts with an original Contract Time in excess of 120 calendar days, DTPW will make price adjustments on each applicable progress estimate to reflect increases or decreases in the price of diesel from those in effect during the month in which bids were received. The Contractor will not be given the option of accepting or rejecting these adjustments. Price adjustments for fuel will be made only when the current fuel price (CFP) varies by more than 5% from the price prevailing in the month when bids were received (BFP), and then only on the portion that exceeds 5%.

2. Price adjustments will be based on the monthly bulk average price for diesel as derived by FDOT. These average indexes shall be determined by averaging bulk fuel prices on the first day of each month as quoted by major oil companies that are reasonably expected to furnish fuel for projects in the State of Florida. Average price indices for will be available on FDOT Construction Office website before the 15th of each month, at the following URL: <https://www.fdot.gov/construction/fuel-bit/fuel-bit.shtm>.
3. Payment will be based on the quantities shown on the progress estimate on all items for which established standard fuel factors are on a file maintained by DTPW. Payment on progress estimates will be adjusted to reflect adjustments in the prices for diesel in accordance with the following:
 - a. When fuel prices have decreased between month of bid and month of this progress estimate:
 - 1) $A_i = F_i (P_i - 0.95 P_b)$ during a period of decreasing prices.
 - 2) A_i = Total dollar amount - positive or negative - of the cost adjustment for fuel used by the Contractor during the month "i."
 - 3) F_i = Total gallons calculated as being used during the month.
 - 4) P_i = Average price for fuel prevailing during month "i."
 - 5) P_b = Average price for fuel prevailing during the month "b" when bids were received on this Contract.
 - b. When fuel prices have increased between month of bid and month of this progress estimate:
 - 1) $A_i = F_i (P_i - 1.05 P_b)$ during a period of increasing prices.
 - 2) A_i = Total dollar amount - positive or negative - of the cost adjustment for fuel used by the Contractor during the month "i."
 - 3) F_i = Total gallons calculated as being used during the month.
 - 4) P_i = Average price for fuel prevailing during month "i."
 - 5) P_b = Average price for fuel prevailing during the month "b" when bids were received on this Contract
4. Payment will be made on the current progress estimate to reflect the index difference at the time Work was performed.
5. Adjustments will be paid or charged to the Prime Contractor only. Any Contractor receiving an adjustment under this provision shall distribute the proper proportional part of such adjustment to subcontractors who perform applicable Work

G. Bituminous Material

- a. On Contracts having an original Contract Time of more than 365 calendar days, or more than 5,000 tons of asphalt concrete, the Department will adjust the bid unit price for bituminous material, excluding cutback and emulsified asphalt to reflect increases or decreases in the Asphalt Price Index (API) of bituminous material from that in effect during the month in which bids were received. Contractor will not be given the option of accepting or rejecting this adjustment. Bituminous adjustments will be made only when the current API (CAPI) varies by more than 5% of the API prevailing in the month when bids were received (BAPI), and then only on the portion that exceeds 5%.
- b. The Department will use the API determined by FDOT and available on the FDOT Office of Construction website L: <https://www.fdot.gov/construction/fuel-bit/fuelbit.shtm>.
- c. Payment on progress estimates will be adjusted to reflect adjustments in the prices for bituminous materials in accordance with the following:
 - 1) \$ Adjustment = (ID)(Gallons)
 - 2) Where ID = Index Difference = $[CAPI - 0.95(BAPI)]$ when the API has decreased between the month of bid and month of this progress estimate.
 - 3) Where ID = Index Difference = $[CAPI - 1.05(BAPI)]$ when the API has increased between the month of bid and month of this progress estimate.
 - 4) Payment will be made on the current progress estimate to reflect the index difference at the time work was performed.
 - 5) For asphalt concrete items payable by the ton, the number of gallons will be determined assuming a mix design with 6.25 percent liquid asphalt weighing 8.58 lb/gal.
 - 6) Asphalt concrete items payable by the square yard will be converted to equivalent tons assuming a weight of 100 lb/yd² per inch.
2. Non-Duplication of Payment: In cases where the basis of payment clause in these Specifications relating to any unit price in the bid schedule requires that the unit price cover and be considered compensation for certain work or material essential to the item, the Department will not measure or pay for this same work or material under any other pay item that may appear elsewhere in these Specifications.

H. Material Adjustments for Aluminum, PVC, and Copper.

1. DTPW will make price adjustments for aluminum, PVC, and copper materials included in the Contract pay item list in accordance with the following procedures:
 - a. Prepare separate Contractor's Certification of Quantities for each material invoice month using the FDOT forms for Material Price Adjustment.
<https://www.fdot.gov/construction/material-price-adjustment>.
 - b. Submit certifications for materials purchased. Submit certifications for subsequent estimate periods as directed by the Engineer, based on the quantity of each material purchased within the estimate period. Material certifications reflecting quantities beyond the final contract quantity shall not be accepted. Ensure each certification includes the Contract Number, Certification Date and Number, the period the certification represents, and the quantity represented by each invoice for each pay item. Submit material invoices with each certification and clearly identify the following:
 - 1) Pay Item Number
 - 2) Certification Quantity
 - 3) Invoice Number
 - 4) Invoice Date
 - 5) Invoice Quantity
 - 6) Invoice Unit Price
 - 7) Invoice Total
2. On Contracts with an original Contract Time of more than 120 days, DTPW will adjust the unit price to reflect increases or decreases in material costs from those in effect during the month in which bids were received. The contractor will not be given the option of accepting or rejecting these adjustments. Price adjustments will be made only when the invoice month material price index (IMP) varies by more than 5% from the price index prevailing in the month when the bids were received (BMP), and then only on the portion that exceeds 5%.
3. DTPW will use factors to determine the percentage of unit price applicable to material only. Price Adjustments will be based on the USDOL monthly Producer Price Index (PPI). The Material Price indices will be available on the FDOT Construction Office website before the 15th of each month at the following website: <https://www.fdot.gov/construction/material-priceadjustment>
4. Payment on progress estimates will be adjusted to reflect adjustments in the prices for aluminum, PVC, and copper materials in accordance with the following:
 - a. $\$ \text{ Adjustment} = (\text{quantity})(\text{unit price})(\text{material factor})(\text{ID})$
 - b. Where $\text{ID} = \text{Index \% Difference} = [\text{IMP} - 0.95(\text{BMP})] / \text{BMP}$ when the IMP has decreased between the month of bid and the month of material invoice.
- c. Where $\text{ID} = \text{Index \% Difference} = [\text{IMP} - 1.05(\text{BMP})] / \text{BMP}$ when the IMP has increased between the month of bid and the month of material invoice.
5. A line-item adjustment will be made on the last progress estimate prior to the final estimate to each applicable pay item to reflect the cumulative value of all Contractor Certification of Quantities submitted throughout the duration of the contract.
6. Adjustments will be paid or charged to the Prime Contractor only. Any Contractor receiving an adjustment under this provision for work performed by a subcontractor shall distribute such adjustment to subcontractors who perform applicable work.
7. DTPW reserves the right to audit the Contractor's records pertaining to the material certifications submitted for this Contract.
 1. Material Adjustments for Steel Guardrail
 1. DTPW will make price adjustments for steel guardrail materials included in the Contract pay item list in accordance with the following procedures:
 2. Prepare separate Contractor's Certification of Quantities for each material invoice month using the FDOT form for Material Price Adjustment.
<https://www.fdot.gov/construction/material-price-adjustment>.
 3. Submit certifications for materials purchased. Submit certifications for subsequent estimate periods as directed by the Engineer, based on the quantity of each material purchased within the estimate period. Material certifications reflecting quantities beyond the final contract quantity shall not be accepted. Ensure each certification includes the Contract Number, Certification Date and Number, the period the certification represents, and the quantity represented by each invoice for each pay item. Submit material invoices with each certification and clearly identify the following:
 4. Pay Item Number
 5. Certification Quantity
 6. Invoice Number
 7. Invoice Date
 8. Invoice Quantity
 9. Invoice Unit Price
 10. Invoice Total
 11. On Contracts with an original Contract Time of more than 120 days, DTPW will adjust the unit price to reflect increases or decreases in material costs from those in effect during the month in which bids were received. The contractor will not be given the option of accepting or rejecting these adjustments. Price adjustments will be made only when the invoice month material price index (IMP) varies by more than 5%

from the price index prevailing in the month when the bids were received (BMP), and then only on the portion that exceeds 5%.

12. DTPW will use factors to determine the percentage of unit price applicable to material only. Price Adjustments will be based on the USDOL monthly Producer Price Index (PPI). The Material Price indices will be available on the FDOT Construction Office website before the 15th of each month at the following website: <https://www.fdot.gov/construction/material-price-adjustment>.
13. Payment on progress estimates will be adjusted to reflect adjustments in the prices for aluminum, PVC, and copper materials in accordance with the following:
 - a. $\$ \text{ Adjustment} = (\text{quantity})(\text{unit price})(\text{material factor})(\text{ID})$
 - b. Where ID = Index % Difference = $[\text{IMP} - 0.95(\text{BMP})] / \text{BMP}$ when the IMP has decreased between the month of bid and the month of material invoice.
 - c. Where ID = Index % Difference = $[\text{IMP} - 1.05(\text{BMP})] / \text{BMP}$ when the IMP has increased between the month of bid and the month of material invoice.
14. : A line-item adjustment will be made on the last progress estimate prior to the final estimate to each applicable pay item to reflect the cumulative value of all Contractor Certification of Quantities submitted throughout the duration of the contract.
15. Adjustments will be paid or charged to the Prime Contractor only. Any Contractor receiving an adjustment under this provision for work performed by a subcontractor shall distribute the proper proportional part of such adjustment to subcontractors who perform applicable work.
16. DTPW reserves the right to audit the Contractor's records pertaining to the material certifications submitted for this Contract.

J. Lump Sum Quantities

1. Error in Lump Sum Quantity: Where the Department designates the pay quantity for an item to be a lump sum and the plans show an estimated quantity, the Department will adjust the lump sum compensation only in the event that either Contractor submits satisfactory evidence or the Department determines from satisfactory evidence that a difference exists between the original plan quantity and final quantity of greater than 5 percent.
2. Authorized Changes in Work: Where the Department designates the pay quantity for an item to be a lump sum and the plans show an estimated quantity, the Department will adjust compensation for that item proportionately when an authorized plan change is made which results in an increase or decrease in the quantity of that item. When the plans do not show an estimated plan quantity or the applicable specifications do not provide adjustments for contingencies, the Department will compensate for any authorized plan change resulting in an increase or decrease in the cost

of acceptably completing the item by establishing a new unit price through a Change Order.

K. Deleted Work

1. The Department will have the right to cancel the portions of the Contract relating to the construction of any acceptable item therein, by the payment to Contractor of a fair and equitable amount covering all items of cost incurred prior to the date that Engineer cancels the work.

L. Partial Payments

1. General:

- a. Engineer will make partial payments on monthly estimates based on the amount of work that Contractor completes during the month (including delivery of certain materials, as specified herein below). Engineer will make approximate monthly payments, and the Department will correct all partial estimates and payments in the subsequent estimates and in the final estimate and payment.
- b. The Department will base the amount of such payments on the total value of the work that Contractor has performed to the date of the estimate, based on the quantities completed as determined by Engineer and the Contract prices, less payments previously made and less any retainage withheld.

2. Withholding Payment for Defective Work: If the Department discovers any defective work or material prior to the final acceptance, or if the Department has a reasonable doubt as to the integrity of any part of the completed work prior to final acceptance, then the Department will not allow payment for such defective or questioned work until Contractor has remedied the defect and removed any causes of doubt.

3. Partial Payments for Delivery of Certain Materials:

a. General:

- 1) The Department may allow partial payments for new materials that will be permanently incorporated into the Project and are stockpiled in approved locations in the project vicinity. Stockpile materials so that they will not be damaged by the elements.
- 2) The following conditions apply to all partial payments for stockpiled materials:
 - a) There must be reasonable assurance that the stockpiled material will be incorporated into the Project.
 - b) The stockpiled material must be approved by Engineer as meeting applicable specifications.

- c) The total quantity for which partial payment is made shall not exceed the estimated total quantity required to complete the Project.
 - d) Contractor must furnish Engineer with copies of certified invoices to document the value of the materials received. The amount of the partial payment will be determined from invoices for the material up to the unit price in the Contract.
 - e) Delivery charges for materials delivered to the jobsite will be included in partial payments if properly documented.
 - f) Partial payments will not be made for materials which were stockpiled prior to award of the Contract for a project.
 - b. Partial Payment Amounts: The following partial payment restrictions apply:
 - 1) Partial payments less than \$5,000 for any one month will not be processed.
 - 2) Partial payments for structural steel and precast prestressed items will not exceed 85% of the Contract price for the item. Partial payments for all other items will not exceed 75% of the Contract price of the item in which the material is to be used.
 - 3) Partial payment will not be made for aggregate and base course material received after paving or base construction operations begin except when a construction sequence designated by the Department requires suspension of paving and base construction after the initial paving operations, partial payments will be reinstated until the paving and base construction resumes.
4. Certification of Payment to Subcontractors:
- a. The term "subcontractor," as used herein, includes persons or firms furnishing materials or equipment incorporated into the work or stockpiled for which the Department has made partial payment and firms working under equipment-rental agreements. Contractor is required to pay all subcontractors for satisfactory performance of their Contracts before the Department will make a further progress (partial) payment. Contractor shall also return all retainage withheld to the subcontractors within 30 days after the subcontractor's work is satisfactorily complete, as determined by the Department. Prior to receipt of any progress (partial) payment, Contractor shall certify that all subcontractors having an interest in the Contract were paid for satisfactory performance of their contracts and that the retainage is returned to subcontractors within 30 days after satisfactory completion of the subcontractor's work. Provide this certification in the form designated by the Department.
 - b. Within 30 days of Contractor's receipt of the final progress payment or any other payments thereafter, except the final payment, Contractor shall pay all subcontractors and suppliers having an interest in the Contract for all work completed and materials furnished. The Department will honor an exception to the above when Contractor demonstrates good cause for not making any required payment and furnishes written notification of any such good cause to both the Department and the affected subcontractors or suppliers within said 30-day period.
- M. Record of Construction Materials
- 1. General: For all construction materials used in the construction of the Project, (except materials for materially generally classed as non-commercial), preserve for the Department's inspection the invoices and records of the materials for a period of five years from the date of completion of the Project. Apply this requirement when subcontractors purchase materials, and obtain the invoices and other materials records from the subcontractors. By providing the materials, Contractor certifies that all invoices will be maintained for the required period.
- N. Recovery Rights, Subsequent to Final Payment
- 1. The Department reserves the right, if it discovers an error in the partial or final payments, or if it discovers that Contractor performed defective work or used defective materials, after the final payment has been made, to claim and recover from Contractor or his surety, or both, by process of law, such sums as may be sufficient to correct the error or make good the defects in the work and materials.
 - 2. Retain all records pertaining to the Project for a period of five years from the date of Engineer's final acceptance of the Project and final payment, or greater if required by record retention laws. Upon request, make all such records available to the Department or its representative. For the purpose of this Article, records include all books of account, supporting documents, and papers that the Department deems necessary to ensure compliance with the Contract provisions.
 - 3. Make all provisions to comply with Florida House Bill (HB) 1309 comply with public records laws.
 - a. Keep and maintain public records that ordinarily and necessarily would be required by the public agency in order to perform the service;
 - b. Provide the public with access to such public records on the same terms and conditions that the public agency would provide the records and at a cost that does not exceed

that provided in chapter 119, F.S., or as otherwise provided by law;

- c. Ensure that public records that are exempt or that are confidential and exempt from public record requirements are not disclosed except as authorized by law; and
- d. Meet all requirements for retaining public records and transfer to the public agency, at no cost, all public records in possession of the contractor upon termination of the contract and destroy any duplicate public records that are exempt or confidential and exempt. All records stored electronically must be provided to the public agency in a format that is compatible with the information technology systems of the agency.

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**DIVISION 100 GENERAL CONSTRUCTION
OPERATIONS**

101 MOBILIZATION (REV. 03-12-2013)

A. Description.

Perform preparatory work and operations in mobilizing for beginning work on the Project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site(s) and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, and sanitary and other facilities.

Include the costs of bonds and any required insurance and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials.

B. Basis of Payment.

When No Separate Item for Mobilization is Included in the Contract:

- a. All work and incidental costs specified as being covered under this Article will be included for payment under the several scheduled items of the overall Contract, and no separate payment will be made therefore.

When a Separate Pay Item for Mobilization is Included in the Contract:

- b. The work and incidental costs specified as being covered under this Article will be paid for at the Contract lump sum price for the Mobilization pay item, after an executed Notice to Proceed has been issued, by partial payments made in accordance with the following:
 - 1) For contracts of 120 contract days duration or less, partial payment will be made at 50% of the bid price per month for the first two months. For contracts in excess of 120 contract days duration, partial payment will be made at 25% of the bid price per month for the first four months. In no event shall more than 50% of the bid price be paid prior to commencing construction on the project site.
 - 2) Total partial payments for Mobilization on any project, including when more than one project or job is included in the Contract, will be limited to 10% of the original Contract amount for that project. Any remaining amount will be paid upon completion of all work on the Contract.
 - 3) Retainage, as specified in the Contract Documents, will be applied to all partial payments.
 - 4) Partial payments made on this Subarticle will in no way act to preclude or limit any of the provisions for partial payments otherwise provided for by the Contract.

Basis of Payment:

- c. No separate item for Mobilization will be provided under this contract.

- d. Payment will be made under:

Item #	Description	Unit
101-1	Mobilization	Lump sum

102 MAINTENANCE OF TRAFFIC (REV. 12-15-2015)

A. Description.

1. General:

- a. Maintain, for the duration of the construction period including any temporary suspensions of the Work, all traffic including pedestrian traffic within the limits of the Project starting the day work begins on the Project or the first day Contract time is charged, or on the day work begins on the work order, whichever is earlier .
- b. Construct and maintain detours.
- c. Provide facilities for access to residences, businesses, etc., along the Project.
- d. Furnish, install and maintain traffic control and safety devices during construction in accordance with FDOT Index 600 Series of the FDOT Design Standards, or as directed by Engineer. MOT includes all facilities, devices and operations as required for safety and convenience of the public within the work zone. Provide pickup, removal and disposal of litter and mow turf or vegetation within the MOT limits as required by Article 107.
- e. Furnish and install work zone pavement markings for maintenance of traffic (MOT) in construction areas.
- f. Provide any other special requirements for safe and expeditious movement of traffic specified in the Plans or directed by Engineer.

2. Unless otherwise directed by Engineer or required by the Contract Documents, do not maintain traffic over those portions of the Project where no work is to be accomplished or where construction operations will not affect existing roads including sidewalks.
3. Do not obstruct or create a hazard to any traffic during the performance of the Work, and repair any damage to existing pavement open to traffic.
4. Traffic may be detoured only upon approval by the County Engineer. Contractor must submit for review and approval an updated MOT plan prior to closure of any roads.
5. The Department may temporarily suspend all activities, except traffic, erosion control and such other activities that are necessary for project maintenance and safety, for failure to comply with these provisions.
6. Due to traffic congestion, work hours other than normal established hours may be required by the Engineer. In the case of extreme traffic or weather conditions, Contractor may be required to remove their operation from the roadway and/or right of way, at the discretion of the Engineer or the Traffic Control Officer at no additional compensation.

B. Materials.

1. Meet the following requirements:

Bituminous Adhesive	FDOT Section 970
Temporary Retroreflective Pavement Markers	FDOT Section 990
Paint	FDOT Section 971
Removable Tape	FDOT Section 990
Glass Spheres	FDOT Section 971
Temporary Traffic Control Device Materials	FDOT Section 990
Retroreflective and Nonreflective Sheeting for Temporary Traffic Control Devices	FDOT Section 994

2. Temporary Traffic Control Devices: Use only the materials meeting the requirements of FDOT Section 990, FDOT Section 994, FDOT Design Standards and the Manual on Uniform Traffic Control Devices (MUTCD).
3. Detour: Provide all materials for the construction and maintenance of all detours.
4. Commercial Materials for Driveway Maintenance: Provide materials of the type typically used by FDOT for roadway base construction, including reclaimed asphalt pavement material, and having stability and drainage properties that will provide a firm surface under wet conditions.

C. Worksite Traffic Supervisor.

1. Provide a worksite traffic supervisor meeting the requirements of Article 105. Provide the worksite traffic supervisor with all equipment and materials needed to set up, take down, maintain traffic control, and handle traffic-related situations.
2. Ensure that the worksite traffic supervisor performs the following duties:
 - a. On site direction of all traffic control on the Project.
 - b. Is on site during all MOT set up and take down, and performs a drive through inspection immediately after set up.
 - c. Is on site during all nighttime operations to ensure proper MOT.
 - d. Immediately corrects all safety deficiencies and does not permit minor deficiencies that are not immediate safety hazards to remain uncorrected for more than 24 hours.
 - e. Is available on a 24 hour per day basis and present within 45 minutes after notification of an emergency situation and is prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.
 - f. Conducts daily daytime and weekly nighttime inspections of projects with predominately daytime work activities, and daily nighttime and weekly daytime inspections of projects with predominantly nighttime work activities of all traffic control devices, traffic flow, pedestrian, bicyclist, and business accommodations.

Advise Engineer and the Project personnel of the schedule of these inspections and give them the opportunity to join in the inspection as is deemed necessary.

3. The Department may disqualify and remove from the Project a worksite traffic supervisor who fails to comply with the provisions of this Article.

D. Submittals

1. Traffic Control Plan

- a. Submit at Contractor's own expense a Traffic Control Plan (TCP) for approval by the County. Sequence the Work in a manner that will minimize disruption of vehicular and pedestrian access through and around the Project's construction area(s).
- b. The TCP must detail procedures and protective measures proposed by Contractor to provide for protection and control of traffic affected by the Work consistent with the following applicable standards:
 - 1) The Contract Documents;
 - 2) "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) and subsequent revisions and addendums, as published by the U.S. Department of Transportation, Federal Highway Administration;
 - 3) The 600 Series indices of the FDOT Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System; and
 - 4) The Miami-Dade County Public Works Manual.
- c. All references to the respective agencies in the above referenced standards shall be construed to also include more stringent requirements of the jurisdictional municipality as applicable for this Work.
- d. The TCP must be signed and sealed by a Professional Engineer registered in the state of Florida and shall include proposed locations and time durations of the following, as applicable:
 - 1) Pedestrian and public vehicular traffic routing.
 - 2) Lane and sidewalk closures, other traffic blockage and lane restrictions and reductions anticipated to be caused by construction operations. Show and describe the proposed location, dates, hours and duration of closure, vehicular and pedestrian traffic routing and management, traffic control devices for implementing pedestrian and vehicular movement around the closures, and details of barricades.
 - 3) Location, type and method of shoring to provide lateral support to the side of an excavation or embankment parallel to an open travel-way.
 - 4) Allowable on-street parking within the immediate vicinity of worksite.
 - 5) Access to buildings immediately adjacent to worksite.
 - 6) Driveways blocked by construction operations.

- 7) Temporary traffic control devices, temporary pavement striping and marking of streets and sidewalks affected by construction
 - 8) Temporary commercial and industrial loading and unloading zones.
 - 9) Construction vehicle reroutes, travel times, staging locations, and number and size of vehicles involved.
 - e. Obtain and submit prior to erection, or otherwise impacting traffic, all required permits from all authorities having jurisdiction, including the Department, if applicable.
2. Alternative Traffic Control Plan.
- a. Where a TCP is provided by the County with the Contract Documents, Contractor may still propose an alternative TCP to the plan presented in the Contract Documents. Prepare the TCP in conformance with the requirements stipulated in this Specification and in the form outlined in the current version of FDOT's Plans Preparation Manual. Indicate in the plan a TCP for each phase of activities. Have Contractor's Engineer of Record sign and seal the alternative plan. Take responsibility for identifying and assessing any potential impacts to a utility that may be caused by the alternate TCP proposed by Contractor, and notify the Department in writing of any such potential impacts to utilities.
 - b. Engineer's approval of the alternate TCP does not relieve Contractor of sole responsibility for all utility impacts, costs, delays or damages, whether direct or indirect, resulting from Contractor initiated changes in the design or construction activities from those in the original Contract Specifications, Design Plans (including TCPs) or other Contract Documents and which effect a change in utility work different from that shown in the Utility Plans, joint project agreements or utility relocation schedules.
 - c. The Department reserves the right to reject any alternative TCP. Obtain Engineer's written approval before beginning work using an alternate TCP. Engineer's written approval is required for all modifications to the TCP. Engineer will only allow changes to the TCP in an emergency without the proper documentation.
3. Comprehensive Weekly Report:
- a. Submit to Engineer a comprehensive weekly report of the daily inspections performed and detailing the condition of all traffic control devices (including pavement markings) being used.
 - b. Include assurances in the report that pedestrians are accommodated with a safe, accessible travel path around work sites separated from mainline traffic in compliance with the Americans with Disabilities Act (ADA) Standards for Transportation Facilities, that existing or detoured bicyclist paths are being maintained satisfactorily throughout the Project limits, and that existing businesses in work areas are being provided with adequate entrances for vehicular and pedestrian traffic during business hours.
 - c. When deficiencies are found, the worksite traffic supervisor is to note such deficiencies and include the proposed or implemented corrective actions, including the date corrected.
 - d. Have the worksite traffic supervisor sign the report and certify that all of the above issues are being handled in accordance with the Contract Documents.
- E. Traffic Control.
1. Standards: FDOT Design Standards are the minimum standards for the use in the development of all TCPs. The MUTCD, Part VI is the minimum national standard for traffic control for highway construction, maintenance, and utility operations. Follow the basic principles and minimum standards contained in these documents for the design, application, installation, maintenance, and removal of all traffic control devices, warning devices and barriers which are necessary to protect the public and workers from hazards within the Project limits.
 2. Maintenance of Roadway Surfaces:
 - a. Maintain all lanes that are being used for the MOT, including those on detours and temporary facilities, under all weather conditions. Keep the lanes reasonably free of dust, potholes and rutting. Provide the lanes with the drainage facilities necessary to maintain a smooth riding surface under all weather conditions.
 3. Number of Traffic Lanes:
 - a. Maintain one lane of traffic in each direction.
 - b. Maintain two lanes of traffic in each direction at existing four (or more) lane cross roads, where necessary to avoid undue traffic congestion.
 - c. Construct each lane used for MOT at least as wide as the traffic lanes existing in the area before commencement of construction.
 - d. Do not allow traffic control and warning devices to encroach on lanes used for MOT.
 - e. Engineer may allow Contractor to restrict traffic to one-way operation for short periods of time provided that Contractor employs adequate means of traffic control and does not unreasonably delay traffic. When a construction activity requires restricting traffic to one-way operations, locate the flaggers within view of each other when possible. When visual contact between flaggers is not possible, equip them with 2-way radios, official, or pilot vehicles, or use traffic signals.
 4. Crossings and Intersections:
 - a. Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any road or street crossing the Project unless approved by Engineer. Before beginning any construction, provide Engineer the names and phone numbers of persons that can be contacted when signal operation malfunctions.
 5. Access for Residences and Businesses: Provide continuous access to all residences and all places of business.
 6. Protection of the Work from Injury by Traffic: Where traffic would be injurious to a base, surface course, or structure constructed as a part of the work, maintain all traffic

outside the limits of such areas until the potential for injury no longer exists.

7. Flagger: Provide trained flaggers in accordance with Article 105.

8. Conflicting Pavement Markings:

- a. Where the lane use or where normal vehicle or pedestrian paths are altered during construction, remove all pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) that will conflict with the adjusted vehicle or pedestrian paths. Use of paint to cover conflicting pavement markings is prohibited. Remove conflicting pavement markings using a method that will not damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions.
- b. Remove all pavement markings that will be in conflict with "next phase of operation" vehicle pedestrian paths as described above, before opening to vehicle traffic or use by pedestrians.
- c. Cost for removing conflicting pavement markings (paint, tape, thermoplastic, raised pavement markers, etc.) to be included in the Project costs for Maintenance of Traffic (General).

9. Vehicle and Equipment Visibility:

- a. Equip all pickups and automobiles used on the Project with a minimum of one Class 2 amber or white warning light that meets the Society of Automotive Engineers Recommended Practice SAE J595, dated November 1, 2008, or SAE J845, dated December 1, 2007, and incorporated herein by reference. Existing lights that meet SAE J845, dated March, 1992, or SAE J1318, dated April, 1986, may be used to its end of service life. Warning lights shall be a high intensity amber or white rotating, flashing, oscillating or strobe light. Lights should be unobstructed by ancillary vehicle equipment such as ladders, racks or booms. If the light is obstructed, additional lights will be required. The lights shall be operating when a vehicle is in a work area where a potential hazard exists, when operating the vehicle at less than the average speed for the facility while performing work activities, making frequent stops or called for in the Plans or FDOT Design Standards.
- b. Equip all other vehicles and equipment with a minimum of 4 square feet of retroreflective sheeting or flashing lights.
- c. To avoid distraction to motorists, do not operate the lights on the vehicles or equipment when the vehicles are outside the clear zone or behind a barrier.

10. No Waiver of Liability: Conduct operations in such a manner that no undue hazard results due to the requirements of this Article. The procedures and policies described herein in no way acts as a waiver of any terms of the liability of Contractor or his surety.

F. Detours.

1. General: Construct and maintain detour facilities wherever it becomes necessary to divert traffic from any

existing roadway or bridge, or wherever construction operations block the flow of traffic.

2. Construction: Plan, construct, and maintain detours for the safe passage of traffic in all conditions of weather. Provide the detour with all facilities necessary to meet this requirement. Where pedestrian facilities are detoured, blocked or closed during the work, provide safe alternate accessible routes through or around the work zone meeting the requirements of the ADA Standards for Transportation Facilities.

3. Construction Methods: Select and use construction methods and materials that provide a stable and safe detour facility. Construct the detour facility to have sufficient durability to remain in good condition, supplemented by maintenance, for the entire period that the detour is required.

4. Removal of Detours: Remove detours when they are no longer needed and before the Contract is completed. Take ownership of all materials from the detour and dispose of them, except for the materials on loan from the Department with the stipulation that they are returned.

5. Detours Over Existing Roads and Streets: When the Department specifies that traffic be detoured over roads or streets outside the Project area, do not maintain such roads or streets. However, maintain all signs and other devices placed for the purpose of the detour.

6. Operation of Existing Movable Bridges:

- a. At the pre-construction meeting, the Engineer and the Contractor will select a date for the County to turn over the bridge maintenance and operations responsibilities. In the event that this date is not discussed, the Contractor will take full responsibility at the NTP date.
- b. In addition to bridge maintenance responsibilities during the duration of the project, Contractor is responsible for having qualified and sufficient number of bridge operators to be able to operate the bridge in accordance USCG regulations – specifically, Title 33- Navigation and Navigable Waters, Chapter I - U.S. Coast Guard, Department of Homeland Security, Subchapter J-Bridges, Part 117--Drawbridge Operation Regulations, Subpart B--Specific Requirements § 117.5.
- c. County's bridge operators are scheduled as follows:

1st Shift:	12am to 8am
2nd Shift:	8am to 4pm
3rd Shift:	4pm to 12am
- d. This allows the bridge to be operational on a 7 days/week, 365 days per year basis.
- e. When removing bridges: Once the bridge is removed Contractor is relieved of this responsibility; however, upon completion of the construction of the new bridge and until the new bridge is officially returned to the County, the contractor is obligated to operate the bridge in accordance with the established USCG regulation.
- f. Make immediate repairs of any damage to such structures caused by use or operations related to the work at no expense to the County, but do not provide

routine repairs or maintenance. In the event that use or operations result in damage to a bridge requiring repairs, give such repairs top priority to any equipment, material, or labor available.

G. Traffic Control Officer.

1. Provide uniformed law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone as required by Engineer and when the following types of work is necessary on projects:
 - a. Directing traffic/overriding the signal in a signalized intersection.
 - b. When FDOT Design Standards, Index No. 655 Traffic Pacing for overhead work is called for in the Plans or approved by Engineer.
 - c. When pulling conductor/cable above an open traffic lane on limited access facilities, when called for in the Plans or approved by Engineer.
 - d. When FDOT Design Standards, Index No. 625 Temporary Road Closure 5 Minutes or Less is used.

H. Driveway Maintenance.

1. General: Ensure that each residence and business has safe, stable, and reasonable access.
2. Construction Methods:
 - a. Place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use.
 - b. As permanent driveway construction is accomplished at a particular location, Contractor may salvage and reuse previously placed materials that are suitable for reuse on other driveways.

I. Temporary Traffic Control Devices.

1. Installation and Maintenance:
 - a. Install and maintain temporary traffic control devices as detailed in the Plans, Index 600 of the FDOT Design Standards and when applicable, in accordance with the approved vendor drawings, as provided on FDOT's Approved Products List (APL) and the TSSQPL. Erect the required temporary traffic control devices to prevent any hazardous conditions and in conjunction with any necessary traffic re-routing to protect the traveling public, workers, and to safeguard the work area. Use only those devices that are on the FDOT APL and the TSSQPL. Immediately remove or cover any devices that do not apply to existing conditions.
 - b. All temporary traffic control devices must meet the requirements of National Cooperative Highway Research Program Report 350 (NCHRP 350) or the Manual for Assessing Safety Hardware 2009 (MASH) and current FHWA directives.
 - c. For devices requiring field assembly or special site preparation, vendor drawings shall include all field assembly details and technical information necessary for proper application and installation and must be

signed and sealed by a Professional Engineer registered in the State of Florida.

- d. Ensure that the FDOT APL number is permanently marked on the device at a readily visible location. Sheeting used on devices is exempt from this marking requirement.
- e. Notify Engineer of any scheduled operation which will affect traffic patterns or safety sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of temporary traffic control devices.
- f. Ensure an employee is assigned the responsibility of maintaining the position and condition of all temporary traffic control devices throughout the duration of the Contract. Keep Engineer advised at all times of the identification and means of contacting this employee on a 24 hour basis.
- g. Keep temporary traffic control devices in the correct position, properly directed, clearly visible and clean, at all times. Ensure that all traffic control devices meet acceptable standards as outlined in American Traffic Safety Services Association (ATSSA) "Quality Guidelines for Temporary Traffic Control Devices and Features". Immediately repair, replace or clean damaged, defaced or dirty devices. Traffic control devices shall not be cleaned while installed/used. Use of warning lights on any temporary traffic control device is prohibited.

2. Work Zone Signs:

- a. Furnish, install, maintain, remove and relocate signs in accordance with the Plans and FDOT Design Standards, Index No. 600. Use signs that meet the material and process requirements of FDOT Section 994. Use Type IV sheeting for fluorescent orange work zone signs. Roll-up signs must meet the requirements of Type VI sheeting. Use Type IV or Type XI sheeting for all other work zone signs. Attach the sign to the sign support using hardware meeting the manufacturer's recommendations on the FDOT APL vendor drawings or as specified in the FDOT Design Standards.

1) Post Mounted Signs:

- a) Meet the requirements of FDOT Section 990-8.

2) Portable Signs:

- a) Use only approved systems, which includes sign stands and attachment hardware (nuts, bolts, clamps, brackets, braces, etc.), meeting the vendor requirements specified on the FDOT APL drawings.
- b) Provide Federal Highway Administration's (FHWA) accepted sign substrate for use with accepted sign stands on the National Highway System (NHS) under the provisions of the NCHRP Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

3) Barrier Mounted Signs:

- a) When post mounting criteria cannot be achieved in accordance with FDOT Design Standards, Index No. 600 and a barrier or traffic railing

exists, use temporary sign criteria provided in FDOT Design Standards, Index No. 11871.

3. Business Signs:

- a. Provide and place signs in accordance with the Plans and FDOT Design Standards, Index No. 600 series. Furnish signs having retroreflective sheeting meeting the requirements of FDOT Section 990.

4. High Intensity Flashing Lights:

- a. Furnish Type B lights in accordance with the Plans and FDOT Design Standards.

5. Warning/Channelizing Devices:

- a. Furnish warning/channelizing devices in accordance with the Plans and FDOT Design Standards.
- b. Retroreflective Collars for Traffic Cones:

- 1) Use collars for traffic cones listed on the FDOT APL that meets the requirements of FDOT Section 990. Use cone collars at night designed to properly fit the taper of the cone when installed. Place the upper 6 inch collar a uniform 3-1/2 inches distance from the top of the cone and the lower 4 inch collar a uniform 2 inches distance below the bottom of the upper 6 inch collar. Ensure that the collars are capable of being removed for temporary use or attached permanently to the cone in accordance with the manufacturer's recommendations. Provide a white sheeting having a smooth outer surface and that has the property of a retroreflector over its entire surface.

c. Barrier Wall (Temporary):

- 1) Furnish, install, maintain, remove and relocate a temporary barrier wall in accordance with the Plans. Ensure that temporary concrete barrier wall for use on roadway sections, complies with FDOT Design Standards, Index Nos. 412, 415 or 414 as specified in the Plans. Ensure that temporary concrete barrier wall for use on bridge and wall sections, complies with FDOT Design Standards, Index No 414 as specified in the Plans.
- 2) Ensure that temporary water filled barrier wall used on roadway sections meets the NCHRP Report 350 criteria or the MASH and is listed on the FDOT APL. Barriers meeting the requirements of FDOT Design Standards, Index Nos. 412, 415 or temporary water filled barriers on the FDOT APL will not be accepted as an alternate to barriers meeting the requirements of FDOT Design Standards, Index No. 414.
- 3) Trailer mounted barriers listed on the FDOT APL may be used at the option of the Contractor. Trailer mounted barriers listed on the FDOT APL must have an FHWA eligibility letter and be successfully crash tested in accordance with MASH TL-3 criteria. All trailer mounted barriers must be equipped with an FDOT APL listed truck mounted attenuator, an FDOT APL listed vehicle mounted arrow board and vehicle warning lights in accordance with this Article
- 4) Temporary Barrier Wall Meeting the Requirements of Design Standards, Index Nos. 412 and 414:

- a) Ensure the marking requirements of the respective Index are met.

5) Proprietary Precast Temporary Barrier Wall Fabricated prior to 2005:

- a) Contractor must submit a certification stating that all unmarked barrier wall units meet the requirements of the Specifications and the FDOT Design Standards. Certifications will be project specific and non-transferable

6) Proprietary Precast Temporary Barrier Wall Fabricated in 2005 or later:

- a) Ensure each wall unit has permanent clear markings, showing the manufacture date, serial number, manufacturer's name or symbol, and the FDOT APL number. Label the markings on a plate, plaque, or cast in the unit. Proprietary barrier wall fabricated prior to 2016 and marked with the "INDX 521" in lieu of the FDOT APL number will be permitted.

7) Glare Screen (Temporary):

- a) Use temporary glare screens listed on the FDOT APL that meet the requirements of FDOT Section 990. Furnish, install, maintain, remove and relocate glare screen systems in conjunction with temporary barrier wall at locations identified in the Plans.
- b) Ensure the anchorage of the glare screen to the barrier is capable of safely resisting an equivalent tensile load of 600 pounds per foot of glare screen, with a requirement to use a minimum of three fasteners per barrier section.
- c) When glare screen is utilized on temporary barrier wall, warning lights will not be required.

8) Longitudinal Channelizing Devices (LCDs):

- a) Furnish LCDs in accordance with the Plans and FDOT Design Standards. LCDs are categorized as vehicular or pedestrian and shall be interlocked. For LCDs requiring internal ballasting, an indicator that clearly identifies the proper ballast level will be required.
- b) Use alternating orange and white pattern for solid color vehicular LCDs. Vehicular LCDs may be substituted for drums, vertical panels, or barricades.

6. Temporary Crash Cushion (Redirective/Gating):

- a. Furnish, install, maintain and subsequently remove temporary crash cushions in accordance with the details and notes shown in the Plans, the FDOT Design Standards, and requirements of the pre-approved alternatives listed on the FDOT APL.
- b. Maintain the crash cushions until their authorized removal. Repair all attachment scars to permanent structures and pavements after crash cushion removal. Make necessary repairs due to defective material, work, or Contractor operations at no cost to the Department.

- c. Restore crash cushions damaged by the traveling public within 24 hours after notification as authorized by Engineer.
7. Guardrail (Temporary):
- a. Furnish guardrail (temporary) in accordance with the Plans and Design Standards. Meet the requirements of Article 536.
8. Arrow Board:
- a. Furnish arrow boards that meet the requirements of FDOT Section 990 as required by the Plans and Design Standards to advise approaching traffic of lane closures or shoulder work.
 - b. Type B arrow boards may be used on low to intermediate speed (0 mph to 50 mph) facilities or for maintenance or moving operations on any speed facility.
 - c. Type C arrow boards shall be used for all other operations on high-speed (50 mph and greater) facilities and may be substituted for Type B arrow boards on any speed facility.
9. Portable Changeable Message Sign (PCMS):
- a. Furnish PCMSs or truck mounted changeable message signs that meet the requirements of FDOT Section 990 as required by the Plans and FDOT Design Standards to supplement other temporary traffic control devices used in work zones.
10. Portable Regulatory Signs (PRS):
- a. Furnish PRSs that meet the requirements of FDOT Section 990 as required by the Plans and FDOT Design Standards.
 - b. Activate portable regulatory signs only during active work activities and deactivate when no work is being performed.
11. Radar Speed Display Unit (RSDU):
- a. Furnish RSDUs that meet the requirements of FDOT Section 990 as required by the Plans and FDOT Design Standards to inform motorists of the posted speed and their actual speed.
 - b. Activate the radar speed display unit only during active work activities and deactivate when no work is being performed.
12. Temporary Signalization and Maintenance:
- a. Provide temporary signalization and maintenance at existing, temporary, and new intersections including but not limited to the following:
 - 1) Installation of temporary poles and span wire assemblies as shown in the Plans,
 - 2) Temporary portable traffic signals as shown in the Plans,
 - 3) Adding or shifting signal heads,
 - 4) Trouble calls,
 - 5) Maintaining intersection and coordination timing and preemption devices.
 - b. Restore any loss of operation within 12 hours after notification.
 - c. Provide traffic signal equipment that meets the requirements of Article 603 of FDOT Design Standards. Engineer may approve used signal equipment if it is in acceptable condition. Replacement components for traffic signal cabinet assemblies will be provided by the maintaining agency.
13. Temporary Traffic Detection and Maintenance:
- a. Provide temporary traffic detection and maintenance at existing, temporary, and new signalized intersections. Provide temporary traffic detection equipment listed on the FDOT APL. Restore any loss of detection within 12 hours. Ensure 90% accuracy per signal phase, measured at the initial installation and after any lane shifts, by comparing sample data collected from the detection system with ground truth data collected by human observation. Collect the sample and ground truth data for a minimum of five minutes during a peak and five minutes during an off-peak period with a minimum three detections for each signal phase. Perform the test in the presence of Engineer.
14. Truck Mounted Attenuators and Trailer Mounted Attenuators:
- a. Furnish, install and maintain only those attenuators that meet the requirements of NCHRP 350 or the MASH.
 - b. Use truck mounted attenuators or trailer mounted attenuators, when called for in the FDOT Design Standards. Use attenuators listed on the FDOT APL.
 - c. When attenuators are called for, use either a truck mounted attenuator or a trailer mounted attenuator system designed and installed in accordance with the manufacturers recommendations.
 - d. Equip the attenuator cartridge with lights and reflectors in compliance with applicable Florida motor vehicle laws, including turn signals, dual tail lights, and brake lights. Ensure that lights are visible in both the raised and lowered positions if the unit is capable of being raised.
 - e. Install either alternating black with yellow or white with orange sheeting on the rear of trailer mounted attenuators and on truck mounted attenuators, in both the operating and raised position. Use Type III (work zone) or Type IV sheeting consisting of 4 or 6 inch wide stripes installed to form chevrons that point upward. All sheeting except black shall be retroreflective.
 - f. Attenuators will not be paid for separately. Include the cost of the truck with either a truck mounted attenuator or a trailer mounted attenuator under Maintenance of Traffic (General). Payment includes all costs, including furnishing, maintaining and removal when no longer required, and all materials, labor, tools, equipment and incidentals required for attenuator maintenance.
15. Temporary Raised Rumble Strip Sets:
- a. When called for in the Plans, furnish, install, maintain, remove, and reinstall temporary raised rumble strip sets.
 - b. Install the temporary raised rumble strip sets per the manufacturer's recommendations and in accordance with FDOT Design Standards, Index No. 603.

- c. The temporary raised rumble strip may be either a removable polymer striping tape or a molded engineered polymer material.

16. Automated Flagger Assistance Devices (AFAD):

- a. Furnish, install, maintain, remove and relocate AFADs in accordance with the Plans and FDOT Design Standards. Position AFADs where they are clearly visible to oncoming traffic and out of the lane of traffic. The devices may be operated either by a single flagger at one end of the traffic control zone, from a central location, or by a separate flagger near each device's location.
- b. AFADs may be either a remotely controlled Stop/Slow AFAD mounted on either a trailer or a movable cart system, or a remotely controlled Red/Yellow Lens AFAD.
- c. AFADs will not be paid for separately. AFADs may be used as a supplement or an alternate to flaggers in accordance with FDOT Index 603. Include the cost for AFADs in Maintenance of Traffic (General).

17. Temporary Lane Separator:

- a. Furnish, install, maintain, remove and relocate temporary lane separator in accordance with the Plans and FDOT Design Standards, Index No 600.
- b. Anchor the portable temporary lane separator with a removable anchor bolt. Use epoxy on bridge decks where anchoring is not allowed. Remove the epoxy from the bridge deck by hydroblasting or other method approved by Engineer.

J. Work Zone Pavement Marking.

1. Description:

- a. Furnish and install work zone pavement markings for MOT in construction areas and in close conformity with the lines and details shown in the Plans and FDOT Design Standards.
- b. Centerlines, lane lines, edge lines, stop bars and turn arrows will be required in work zones prior to opening the road to traffic.
- c. The most common types of work zone pavement markings are painted pavement markings and removable tape. Other types of work zone pavement markings may be identified in the Plans.

2. Painted Pavement Markings:

- a. General: Use painted pavement markings meeting the requirements of Article 710. Use standard waterborne paint unless otherwise identified in the Plans or approved by Engineer.

3. Removable Tape:

- a. General: Use removable tape listed on the FDOT APL and meeting the requirements of FDOT 990-4.
- b. Application: Apply removable tape with a mechanical applicator to provide pavement lines that are neat, accurate and uniform. Equip the mechanical applicator with a film cut-off device and with measuring devices that automatically and accumulatively measure the length of each line placed within an accuracy tolerance

of plus or minus 2%. Ensure removable tape adheres to the road surface. Removable tape may be placed by hand on short sections, 500 feet or less, if it is done in a neat accurate manner.

- c. Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 300 mcd/lx·m² for white and contrast markings and not less than 250 mcd/lx·m² for yellow markings. Black portions of contrast tapes and black masking tapes must be non-reflective and have a reflectance of less than 5 mcd/lx m². At the end of the six month service life, the retroreflectance of white and yellow removable tape shall not be less than 150 mcd/lx·m².
 - d. Removability: Provide removable tape capable of being removed from bituminous concrete and portland cement concrete pavement intact or in substantially large strips, either manually or by a mechanical roll-up device, at temperatures above 40°F, without the use of heat, solvents, grinding or blasting.
4. Temporary Retroreflective Pavement Markers (RPM's): Use markers listed on the FDOT APL and meeting the requirements of FDOT 990-5. Apply all markers in accordance with the FDOT Design Standards, Index Nos. 600 and 17352, prior to opening the road to traffic. Replace markers any time after installation when more than three consecutive markers fail or are missing, at no expense to the Department, in a timely manner, as directed by Engineer.

K. Method of Measurement.

1. General:

- a. Devices installed/used on the Project on any calendar day or portion thereof, within the allowable Contract Time, including time extensions which may be granted, will be paid for at the Contract unit price for the applicable pay item, except those paid for as Maintenance of Traffic (General).
- b. One or more of the following items may appear in a contract in addition to a direct payment item for Maintenance of Traffic (Lump Sum). Unless otherwise stipulated in the Contract Documents, only those items with an Awarded Unit Price will be considered for direct payment.

2. Traffic Control Officers:

- a. The County will reimburse Contractor for the services of uniformed law enforcement officers authorized to serve as traffic control officers for the purpose of controlling or directing traffic in the work zone as part of the County approved Traffic Control Plan and Maintenance of Traffic provided by Contractor pursuant to the Contract Documents.
- b. The quantity to be paid for will be the invoice unit price per hour for the actual number of officers certified to be on the project site, including any law enforcement vehicles and all other direct and indirect costs.
- c. Payment will be made at invoice cost from an appropriate dedicated allowance established by the County.

- d. Payment will be made only for those Traffic Control Officers specified in the Plans and authorized by the Engineer. The necessary invoices and documentation must be submitted to the Engineer along with the payment request.
3. Special Detours:
 - a. When a detour facility is specifically detailed in the Plans, or is otherwise described or detailed as a special item, and an item for separate payment is included in the proposal, the work of constructing, maintaining, and subsequently removing such detour facilities will be paid for separately. Traffic control devices, warning devices, barriers, signing, and pavement markings for special detours will also be paid for separately.
 - b. When the Plans show more than one detour, each detour will be paid for separately, at the Contract lump sum price for each.
 - c. Where a separate item for a specific detour facility is included in the proposal, payment will be made under special detour.
 4. Commercial Material for Driveway Maintenance:
 - a. The quantity to be paid for will be the certified volume, in cubic yards, of all materials authorized by the Engineer, acceptably placed, compacted and maintained for driveway maintenance. The volume, which is authorized to be reused, and which is acceptably salvaged, placed, compacted and maintained in other designated driveways will be included again for payment.
 - b. Arrow Board: The quantity to be paid at the contract unit price will be for the number of arrow boards certified as installed/used on the project on any calendar day or portion thereof within the contract time.
 5. Work Zone Signs:
 - a. The number of temporary post-mounted signs (temporary regulatory, warning and guide) certified as installed/used on the project will be paid for at the Contract unit price for work zone signs. When multiple signs are located on single or multiple posts, each sign panel will be paid individually. Signs greater than 20 square feet and detailed in the Plans will be paid for under Maintenance of Traffic (General).
 - b. Temporary portable signs (excluding mesh signs) and vehicular mounted signs will be included for payment under work zone signs, only if used in accordance with the FDOT Design Standards.
 - c. The number of temporary barrier mounted signs (temporary regulatory, warning and guide) certified as installed/used on the project will be paid for at the Contract unit price for barrier mounted work zone signs.
 6. Business Signs:
 - a. The number of business signs certified as installed/used on the project will be paid for at the Contract unit price for business signs.
 7. High Intensity Flashing Lights:
 - a. The number of high intensity flashing lights (Type B) certified as installed/used on the project will be paid for at the Contract unit price for high intensity flashing lights (temporary - Type B).
 8. Channelizing Devices:
 - a. The number of drums, vertical panels, pedestrian LCDs, and Type I, Type II, Type III, or direction indicator barricades, certified as installed/used on the project meeting the requirements of FDOT Design Standards, Index No. 600 and have been properly maintained will be paid for at the Contract unit prices for channelizing device.
 - b. Payment for vehicular LCDs will be paid as the length in feet installed divided by the device spacing for barricades, vertical panels, and drums and certified as installed/used on the project meeting the requirements of FDOT Design Standards, Index No. 600 and have been properly maintained will be paid for at the Contract unit price for channelizing device.
 - c. Payment will not be made for channelizing devices unsatisfactorily maintained, as determined by the Engineer.
 - d. Payment will be made for each channelizing device that is used to delineate trailer mounted devices.
 - e. Payment will be made for channelizing devices delineating portable changeable message signs during the period beginning 14 working days before Contract Time begins as authorized by the Engineer.
 9. Barrier Wall (Temporary):
 - a. The Contract unit price for barrier wall (temporary) will be full compensation for furnishing, installing, maintaining, and removing the barrier wall. When called for, the Contract unit price for barrier wall (temporary/relocate) will be full compensation for relocating the barrier. The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.
 10. Barrier Delineators:
 - a. The number of barrier delineators, installed on top of barrier wall, used on the project, meeting the requirements of FDOT Design Standards and Article 705.
 11. Lights, Temporary, Barrier Wall Mount:
 - a. The number of Type C steady burn lights, mounted on barrier wall, certified as installed/used on the project, meeting the requirements of the Design Standards and have been properly maintained will be paid for at the Contract unit price for lights temporary, barrier wall mount.
 12. Glare Screen (Temporary):
 - a. The certified quantity to be paid for will be determined by the number of sections times the nominal length of each section.
 13. Temporary Crash Cushions:
 - a. Redirective:
 - 1) The quantity to be paid for will be the number of temporary crash cushions (redirective) certified as installed/used and maintained on the project, including object marker.

b. Gating:

- 1) The quantity to be paid for will be the number of temporary crash cushions (gating) certified as installed/used and maintained on the project, including object marker.

14. Temporary Guardrail:

- a. The quantity to be paid for will be the length, in feet, of temporary guardrail constructed and certified as installed/used on the project. The length of a run of guardrail will be determined as a multiple of the nominal panel lengths.

15. Arrow Board:

- a. The quantity to be paid at the Contract unit price will be for the number of arrow boards certified as installed/used on the project on any calendar day or portion thereof within the Contract time.

16. Portable Changeable Message Sign:

- a. The quantity to be paid at the Contract unit price will be for the number of portable changeable message signs or truck mounted changeable message signs certified as installed/used on the project on any calendar day or portion thereof within the Contract time.
- b. Payment will be made for each portable changeable message sign that is used during the period beginning fourteen working days before Contract Time begins as authorized by Engineer.

17. Portable Regulatory Signs:

- a. The quantity to be paid for will be the number of portable regulatory signs certified as installed/used on the project on any calendar day or portion thereof within the Contract time, will be paid for the Contract unit price for portable regulatory sign.

18. Radar Speed Display Unit:

- a. The quantity to be paid for will be the number of radar speed display units certified as installed/used on the project on any calendar day or portion thereof within the Contract Time, will be paid for the Contract unit price for radar speed display unit.

19. Temporary Signalization and Maintenance:

- a. For existing intersections, the quantity to be paid for will be the number of signalized intersections per day for the full duration of the Contract. For temporary intersections, the quantity to be paid for will be the number of signalized intersections per day for the duration of the temporary intersection. No separate payment will be made for temporary signalization and maintenance at new intersections.

20. Temporary Traffic Detection and Maintenance:

- a. For existing intersections, the quantity to be paid for will be the number of signalized intersections per day beginning the day Contract Time begins and ending the day the permanent detection is operational and the final lane configuration is in place. For temporary and new intersections, the quantity to be paid for will be the number of signalized intersections per day beginning the day the temporary detection is functional and

ending the day the permanent detection is operational and the final lane configuration is in place for a new intersection; or, when the detection is removed for a temporary intersection.

21. Work Zone Pavement Markings:

- a. The quantities, furnished and installed, to be paid for will be the length of skip and solid pavement markings, and the area of pavement markings placed as follows:
 - 1) The total transverse distance, in feet, of skip pavement marking authorized and acceptably applied. The length of actual applied line will depend on the skip ratio of the material used. Measurement will be the distance from the beginning of the first stripe to the end of the last stripe with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to the requirements of the Contract Documents.
 - 2) The net length, in feet, of solid pavement marking authorized and acceptably applied.
 - 3) The number of directional arrows or pavement messages authorized and acceptably applied.
 - 4) The number of temporary RPM's authorized and acceptably applied.

22. Temporary Raised Rumble Strips:

- a. The quantity to be paid for will be the number of temporary raised rumble strip sets certified as installed/used on the project on any calendar day or portion thereof within the Contract Time.
- b. The number of strips used must meet the requirements of FDOT Design Standards, Index No. 603. No adjustment will be made to the per day measurement for the number of strips or sets used, or for the number of times the sets are relocated.

23. Temporary Lane Separator:

- a. The quantity of temporary lane separator to be paid for will be plan quantity, in feet, including drainage gaps, completed and accepted.

L. Submittals.

1. Submittal Instructions:

- a. Prepare a certification of quantities for certified MOT payment items for each project in the Contract. Submit the certification of quantities to Engineer. The Department will not pay for any disputed items until Engineer approves the certification of quantities.

2. Contractor's Certification of Quantities:

- a. Request payment by submitting a certification of quantities as directed by Engineer, based on the amount of work done or completed. Ensure the certification consists of the following:
- b. Contract Number, Certification Date and the period that the certification represents.
- c. The basis for arriving at the amount of the progress certification, less payments previously made and less an amount previously retained or withheld. The basis

will include a detail breakdown provided on the certification of items of payment in accordance with 102-M. After the initial setup of the MOT items and counts, the interval for recording the counts will be made weekly on the certification sheet unless there is a change. This change will be documented on the day of occurrence. Some items may necessitate a daily interval of recording the counts.

M. Basis of Payment.

1. Maintenance of Traffic (General):

- a. No Direct Payment Provided: When no item for direct payment of Maintenance of Traffic (Lump Sum) is provided by the Contract, the costs for performing all work and requirements specified under this Article, except as may be specifically covered for payment under other items, will be included among the various scheduled items of the Contract.
- b. Direct Payment Provided: When direct payment for Maintenance of Traffic (Lump Sum) is provided in the Contract, the quantity to be paid all work and costs specified under this Article, except as may be specifically covered for payment under other items, will be the lump sum Contract Price.

2. Additional items of Direct Payment. Only those items with an Awarded Unit Price will be considered for direct payment.

a. Traffic Control Officers:

- 1) Price and payment will be full compensation for the services of the traffic control officers at invoice cost as specified under subarticle 102.K.2 above.

b. Special Detours:

- 1) Price and payment will be full compensation for providing all detour facilities shown in the Plans and all costs incurred in carrying out all requirements of this Article for general MOT within the limits of the detour, as shown in the Plans.

c. Commercial Materials for Driveway Maintenance:

- 1) Price and payment will be full compensation for all work and materials specified for this item, including specifically all required shaping and maintaining of driveways.

d. Work Zone Signs:

- 1) Price and payment will be full compensation for all work and materials for furnishing signs, supports and necessary hardware, installation, relocating, maintaining and removing signs.

e. Business Signs:

- 1) Price and payment will be full compensation for all materials and labor required for furnishing, installing, relocating, maintaining, and removing the signs as well as the cost of installing any logos provided by business owners.

f. High Intensity Warning Lights:

- 1) Price and payment will be full compensation for furnishing, installing, operating, relocating,

maintaining and removing high intensity flashing lights (Type B).

g. Channelizing Devices:

- 1) Prices and payment will be full compensation for furnishing, installing, relocating, maintaining and removing the channelizing devices, including the costs associated with attached warning lights as required.

h. Barrier Wall (Temporary):

- 1) Price and payment will be full compensation for furnishing, installing, maintaining, and removing the barrier. When called for, barrier wall (temporary) (relocate) will be full compensation for relocating the barrier.

i. Lights, Temporary, Barrier Wall Mount:

- 1) Price and payment will be full compensation for all work and materials for furnishing, installing and maintaining the warning lights mounted on barrier wall. Payment will not be made for lights that are improperly placed or are not working.

j. Barrier Delineators:

- 1) No separate payment will be made for barrier delineators installed on top of temporary barrier wall. The cost of furnishing, installing and maintaining the barrier delineators will be included in the cost of the temporary barrier wall.

k. Glare Screen (Temporary):

- 1) Price and payment will be full compensation for furnishing, installing, maintaining, and removing the glare screen certified as installed/used on the project. When called for, glare screen (relocate) will be full compensation for relocating the glare screen.

l. Temporary Crash Cushion (Redirective/Gating):

- 1) Price and payment will be full compensation for furnishing, installing, maintaining and subsequently removing such crash cushions. Payment for restoring damaged crash cushions will be the manufacturer's/distributor's invoice price for the new materials/parts plus 20% markup. The 20% markup is compensation for all necessary work including; but not limited to, labor, equipment, supplies and profit, as authorized by Engineer. Additional MOT required for the repair of the crash cushion will be paid for under the appropriate MOT pay item.

m. Temporary Guardrail:

- 1) Price and payment will be full compensation for furnishing all materials required for a complete installation, including end anchorage assemblies and any end connections to other structures and for installing, maintaining and removing guardrail.

n. Arrow Board:

- 1) Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing arrow boards.

o. Portable Changeable Message Sign:

- 1) Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing portable changeable message signs.

p. Portable Regulatory Signs:

- 1) Price and payment will be full compensation for furnishing, installing, relocating, maintaining and removing a completely functioning system as described in these Specifications portable regulatory signs. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing portable regulatory signs.
- 2) Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or MOT operations.

q. Radar Speed Display Unit:

- 1) Price and payment will be made only for a completely functioning system as described in these specifications. Payment will include all labor, hardware, accessories, signs, and incidental items necessary for a complete system.
- 2) Payment will include any measurements needed to insure that the unit conforms to all specification requirements.
- 3) Payment will include all labor, materials, incidentals, repairs and any actions necessary to operate and maintain the unit at all times that work is being performed or traffic is being affected by construction and/or MOT operations. Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing radar speed display unit.

r. Temporary Signalization and Maintenance:

- 1) Price and payment will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic control signals including all equipment and components necessary to provide an operable traffic signal. Payment will be withheld for each day at each intersection where the temporary signalization is not operational within 12 hours after notification.

s. Temporary Traffic Detection and Maintenance:

- 1) Price and payment will constitute full compensation for furnishing, installing, operating, maintaining and removing temporary traffic detection including all equipment and components necessary to provide an acceptable signalized intersection. Take ownership of all equipment and components. Payment will be withheld for each day at each intersection where the temporary detection is not operational within 12 hours after notification.

t. Temporary Raised Rumble Strips:

- 1) Price and payment will be full compensation for all work and materials described in this Article, including all cleaning and preparing of surfaces, disposal of all debris, furnishing of all materials, application, curing, removal, reinstalling and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work.

u. Work Zone Pavement Markings:

- 1) Price and payment will be full compensation for all work specified including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.
- 2) Removable tape may be substituted for work zone paint at no additional cost to the Department.
- 3) Payment for temporary RPMs used to supplement line markings will be paid for under temporary retroreflective pavement markers. Install these markers as detailed in the Design Standards.

v. Temporary Lane Separator:

- 1) Price and payment will be full compensation for all work specified in this Article.

3. Payment Items: Payment will be made under:

- 1) 102-1-A -1 Maintenance of Traffic

104 PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION (REV. 01-09-12)

A. Description.

Provide erosion control measures on the Project and in areas outside the right-of-way where work is accomplished in conjunction with the Project, so as to prevent pollution of water, detrimental effects to public or private property adjacent to the Project right-of-way, and damage to work on the Project.

Construct and maintain temporary erosion control features and, as required, construct and maintain permanent erosion control features as shown in the Plans or as may be directed by Engineer.

B. General.

Coordinate the installation of temporary erosion control features with the construction of the permanent erosion control features to the extent necessary to ensure economical, effective, and continuous control of erosion and water pollution throughout the life of the Contract.

Maintain, at the work site, copies of all documents referenced by this Specification including: the Departmental Stormwater Pollution Prevention Plan (if provided); the approved contractor Erosion Control Plan; and applicable inspection reports, permits and certifications. Document

compliance with all requirements pertaining to the aforementioned documents and this Specification.

Engineer may direct, when warranted by unforeseen conditions, the use of control features or methods other than those included in the original Contract. In such event, the Department will pay for this additional work as unforeseeable work.

C. Control of Contractor's Operations Which May Result in Water Pollution.

Prevent pollution of streams, canals, lakes, reservoirs, and other water impoundments with fuels, oils, bitumens, calcium chloride, or other harmful materials.

Conduct and schedule operations to avoid or otherwise minimize pollution or siltation of such water impoundments, and to avoid interference with movement of migratory fish. Do not dump any residue from dust collectors or washers into any water body.

Restrict construction operations in rivers, streams, lakes, tidal waters, reservoirs, canals, and other water impoundments to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the Plans and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit, promptly clear rivers, streams, and impoundments of all obstructions placed therein or caused by construction operations.

Do not frequently ford live streams with construction equipment. Wherever an appreciable number of stream crossings are necessary at any one location, use a temporary bridge or other structure.

Except as necessary and authorized for Project construction, do not deposit excavated material in rivers, streams, canals, or impoundments, or in a position close enough thereto, to be washed away by high water or runoff.

Where pumps are authorized for use in removing highly turbid waters from enclosed construction areas such as cofferdams or forms, treat the water by one or more of the following methods prior to discharge into State waters:

- a. Pumping into grassed swales or appropriate vegetated areas or sediment basins.
- b. Confined by an appropriate enclosure such as turbidity barriers when other methods are not considered appropriate.

Do not disturb lands or waters outside the limits of construction as staked, except as authorized by Engineer.

Obtain Engineer's approval for the location of, and method of operation in, borrow pits, material pits, and disposal areas furnished for waste material from the project (other than commercially operated sources) such that erosion during and after completion of the work will not result in probability of detrimental siltation or water pollution.

D. Materials for Temporary Erosion Control.

Engineer will not require testing of materials used in construction of temporary erosion control features other than as provided for geotextile fabric in FDOT 985-3 unless such material is to be incorporated into the completed Project.

When no testing is required, Engineer will base acceptance on visual inspection.

Contractor may use new or used materials, subject to Engineer's approval, for the construction of temporary silt fence, staked turbidity barriers, and floating turbidity barrier not to be incorporated into the completed Project.

E. Erosion Control Plan.

Prepare the Erosion Control Plan (ECP) in a format acceptable to the Department and in accordance with the planned sequence of operations.

At the Preconstruction Conference, submit to the Department an ECP that:

- a. Meets the requirements or conditions of all permits authorizing construction of the Project. Where no permits are required or the approved permits do not contain conditions that specifically addresses erosion and water pollution, the requirements of the ECP will be governed by the Contract Documents and all applicable laws, rules, or regulations.
- b. Accompanies the Department's Stormwater Pollution Prevention Plan (SWPPP) when a SWPPP is provided for the Project.
- c. Includes and describes for each phase of construction operations or activities the following:
 - 1) Locations of all erosion control devices
 - 2) Types of all erosion control devices
 - 3) Estimated time erosion control devices will be in operation
 - 4) Monitoring schedules for maintenance of erosion control devices
 - 5) Methods of maintaining erosion control devices
 - 6) Containment or removal methods for pollutants or hazardous wastes
 - 7) The name and telephone number of the person responsible for monitoring and maintaining the erosion control devices.
- d. Includes procedures to control off-site tracking of soil by vehicles and construction equipment and a procedure for cleanup and reporting of non-stormwater discharges.
- e. Describes all phases of operations, the prevention, control, and abatement of erosion and water pollution items or activities necessary for the Project, to include:
 - 1) Types and locations of all erosion control devices
 - 2) Estimated time erosion control devices will be in operation
 - 3) Monitoring schedules for maintenance of erosion control devices

- 4) Methods for maintaining erosion control devices
- 5) Containment or removal methods for pollution or hazardous wastes
- 6) Name and telephone number of the person responsible for monitoring and maintaining the erosion control devices.

Contractor must obtain Engineer's written approval of the ECP prior to commencing any construction activities.

For project requiring a Florida Department of Environmental Protection (FDEP) Generic Permit for Stormwater Discharge from Large and Small Construction Activities (Generic Permit):

- f. Failure to sign any documents or certification statements required by the FDEP Generic Permit will be considered a default of the Contract.
- g. Any soil disturbing activities performed without the required signed documents or certifications statements may be considered a violation of the FDEP Generic Permit.

F. Construction Requirements.

Limitation of Exposure of Erodible Earth:

- a. Engineer may limit the surface areas of unprotected erodible earth exposed by the construction operation and may direct Contractor to provide erosion or pollution control measures to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal, or other water impoundments or to prevent detrimental effects on property outside the Project right-of-way or damage to the Project.
- b. Limit the area in which excavation and filling operations are being performed so that it does not exceed the capacity to keep the finish grading, turf, sod, and other such permanent erosion control measures current in accordance with the accepted schedule.
- c. Do not allow the surface area of erodible earth that clearing and grubbing operations or excavation and filling operations expose to exceed 750,000 square feet without specific prior approval by Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operations.
- d. Engineer may increase or decrease the amount of surface area the Contractor may expose at any one time.

Incorporation of Erosion and Sediment Control Features:

- e. Incorporate permanent erosion control features into the project at the earliest practical time. Use temporary erosion and sediment control features found in the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (E&SC Manual) to correct conditions that develop during construction which were not foreseen at the time of design, to control erosion and sediment prior to the time it is practical to construct permanent control features, or to provide immediate temporary control of erosion and sediment that develops during normal construction operations, which are not associated with permanent erosion control features on the project. An electronic version of the

E&SC Manual can be found at the following URL:
<http://www.dot.state.fl.us/specificationoffice/Implemented/URLinSpecs/Files/FL ErosionSedimentManual060709.pdf>

- f. Install all sediment control devices in a timely manner to ensure the control of sediment and the protection of lakes, streams, gulf or ocean waters, or any wetlands associated therewith and to any adjacent property outside the right-of-way as required.
- g. At sites where exposure to such sensitive areas is prevalent, complete the installation of any sediment control device prior to the commencement of any earthwork.
- h. After installation of sediment control devices, repair portions of any devices damaged at no expense to the Department. Engineer may authorize temporary erosion and sediment control features when finished soil layer is specified in the Contract and the limited availability of that material from the grading operations will prevent scheduled progress of the work or damage the permanent erosion control features.

Scheduling of Successive Operations:

- i. Schedule operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations, and the duration of exposure of uncompleted construction to the elements is as short as practicable.
- j. Schedule and perform clearing and grubbing so that grading operations can follow immediately thereafter. Schedule and perform grading operations so that permanent erosion control features can follow immediately thereafter if conditions on the project permit.

Details for Temporary Erosion and Sediment Control Features:

- k. General: Use temporary erosion, sediment and water pollution control features found in the E&SC Manual. These features consist of, but are not limited to, temporary turf, rolled erosion control products, sediment containment systems, runoff control structures, sediment barriers, inlet protection systems, silt fences, and turbidity barriers. For design details for some of these items, refer to the Plans, the FDOT Design Standards and E&SC Manual.
- l. Temporary Sod: Engineer may designate certain areas of sod constructed in accordance with the Specifications as temporary erosion control features. For areas not defined as sod, constructing temporary turf by seeding only is not an option for temporary erosion control under this Article. Engineer may waive the turf establishment requirements of the Specifications for areas with temporary sod that will not be a part of the permanent construction. The work of placing temporary sod, approved as a temporary erosion control feature where directed by Engineer and in accordance with these Specifications, will be paid for as unforeseeable work.
- m. Runoff Control Structures: Construct runoff control structures in accordance with the details shown in the

- Plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function.
- n. Sediment Containment Systems: Construct sediment containment systems in accordance with the details shown in the Plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function. Clean out sediment containment systems as necessary in accordance with the Plans or as directed.
 - o. Sediment Barriers: Provide and install sediment barriers according to details shown in the Plans, as directed by Engineer, or as shown in the E&SC Manual to protect against downstream accumulation of sediment. Sediment Barriers include, but are not limited to synthetic bales, silt fence, fiber logs and geosynthetic barriers. Reusable barriers that have had sediment deposits removed may be reinstalled on the Project as approved by Engineer.
 - p. Silt Fence:
 - 1) General: Furnish, install, maintain, and remove silt fences, in accordance with the manufacturer's directions, these Specifications, the details as shown on the Plans, the FDOT Design Standards, and the E&SC Manual.
 - 2) Materials and Installation: Use a geotextile fabric made from woven or nonwoven fabric, meeting the physical requirements of FDOT Section 985 according to those applications for erosion control. Choose the type and size of posts, wire mesh reinforcement (if required), and method of installation. Do not use products which have a separate layer of plastic mesh or netting. Provide a durable and effective silt fence that controls sediment comparable to the FDOT Design Standards and the E&SC Manual. Erect silt fence at upland locations, across ditch lines and at temporary locations shown on the plans or approved by Engineer where continuous construction activities change the natural contour and drainage runoff. Do not attach silt fence to existing trees unless approved by Engineer.
 - 3) Inspection and Maintenance: Inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfall. Immediately correct any deficiencies. In addition, make a daily review of the location of silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, install additional silt fences as directed by Engineer. Remove sediment deposits when the deposit reaches approximately 1/2 of the volume capacity of the silt fence or as directed by Engineer. Dress any sediment deposits remaining in place after the silt fence is no longer required to conform with the finished grade, and prepare them in accordance with the Contract Documents and as directed by Engineer.
 - q. Floating Turbidity Barriers and Staked Turbidity Barriers:
 - 1) Install, maintain, and remove turbidity barriers to contain turbidity that may occur as the result of dredging, filling, or other construction activities which may cause turbidity to occur in the waters of the State. Contractor may need to deploy turbidity barriers around isolated areas of concern such as seagrass beds, coral communities, etc. both within as well as outside the right-of-way limits. Engineer will identify such areas. Place the barriers prior to the commencement of any work that could impact the area of concern. Install the barriers in accordance with the details shown in the Plans or as approved by Engineer. Ensure that the type barrier used and the deployment and maintenance of the barrier will minimize dispersion of turbid waters from the construction site. Engineer may approve alternate methods or materials.
 - 2) Operate turbidity barriers in such a manner to avoid or minimize the degradation of the water quality of the surrounding waters and minimize damage to areas where floating barriers installed.
 - r. Inlet Protection System: Furnish and install inlet protection systems as shown in the Plans, FDOT Design Standards and the E&SC Manual.
 - s. Rolled Erosion Control Products (RECPs):
 - 1) General: Install RECPs in locations where temporary protection from erosion is needed. Two situations occur that require artificial coverings each having differing material requirements.
 - a) Temporary pauses in construction: Use RECPs composed of natural or synthetic fiber mats, plastic sheeting, or netting as protection against erosion, when directed by Engineer, during temporary pauses in construction caused by inclement weather or other circumstances. Remove the material when construction resumes.
 - b) Facilitating plant growth: Use RECPs as erosion control blankets, at locations shown in the plans, to facilitate plant growth while permanent grassing is being established. For the purpose described, use non-toxic, biodegradable, natural or synthetic woven fiber mats. Install erosion control blankets capable of sustaining a maximum design velocity of 6.5 ft/sec as determined from tests performed by Utah State University, Texas Transportation Institute or an independent testing laboratory approved by the Department. Furnish to Engineer, two certified copies of manufacturers test reports showing that the erosion control blankets meet the requirements of this Specification. Certification must be attested, by a person having legal authority to bind the manufacturing company. Also, furnish two 4 by 8 inch samples for product identification. The manufacturers test records shall be made available to the Department upon request. Leave the material in place, as installed, to biodegrade.

Removal of Temporary Erosion Control Features: In general, remove or incorporate into the soil any temporary erosion control features existing at the time of construction of the

permanent erosion control features in an area of the Project in such a manner that no detrimental effect will result. Engineer may direct that temporary features be left in place.

G. Maintenance of Erosion and Sediment Control Features.

General: Provide routine maintenance of permanent and temporary erosion and sediment control features, at no expense to the Department, until the Project is complete and accepted. If reconstruction of such erosion and sediment control features is necessary due to Contractor's negligence or carelessness or, in the case of temporary erosion and sediment control features, failure by the Contractor to install permanent erosion control features as scheduled, Contractor must replace such erosion control features at no expense to the Department. If reconstruction of permanent or temporary erosion and sediment control features is necessary due to factors beyond the control of Contractor, the Department will pay for replacement under the appropriate Contract pay item or items.

Inspect all erosion and sediment control features at least once every seven calendar days and within 24 hours of the end of a storm of 0.50 inches or greater. Maintain all erosion control features as required in the SWPPP, Contractor's ECP, the E&SC Manual, and as specified in the State of Florida Department of Environmental Protection Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

H. Protection During Suspension of Contract Time.

If it is necessary to suspend the construction operations for any appreciable length of time, shape the top of the earthwork in such a manner to permit runoff of rainwater, and construct earth berms along the top edges of embankments to intercept runoff water. Provide temporary slope drains to carry runoff from cuts and embankments that are in the vicinity of rivers, streams, canals, lakes, and impoundments. Locate slope drains at intervals of approximately 500 feet, and stabilize them by paving or by covering with waterproof materials. Should such preventive measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation. Engineer may direct Contractor to perform, during such suspensions of operations, any other erosion and sediment control work deemed necessary.

I. Method of Measurement.

Direct Payment Provided:

- a. When separate items for temporary erosion control features are included in the Contract and have awarded Contract prices, the quantities to be paid for will be the:
 - 1) Area, in square yards, of Rolled Erosion Control Products.
 - 2) Length, in feet, of Runoff Control Structures, measured along the surface of the work constructed.

- 3) Number of Sediment Containment Systems constructed and accepted.
- 4) Number of Sediment Containment System Cleanouts accomplished and accepted.
- 5) Length, in feet, of Sediment Barriers.
- 6) Length, in feet, of Floating Turbidity Barrier.
- 7) Length, in feet, of Staked Turbidity Barrier.
- 8) Number of inlet protection systems.

- b. Upon acceptance by the Engineer, the quantity of floating turbidity barriers, sediment barriers, staked turbidity barriers, and inlet protection devices will be paid for regardless of whether materials are new, used, or relocated from a previous approved installation on the Project.

No Direct Payment Provided: Unless otherwise specified, when no item for direct payment of temporary erosion control features is provided by the Contract, the costs for performing all work and meeting the requirements of this Article will be included among the various scheduled items of the Contract.

J. Basis of Payment.

Prices and payments will be full compensation for all work specified in this Article, including construction and routine maintenance of temporary erosion control features.

Any additional costs resulting from compliance with the requirements of this Article, other than construction, routine maintenance, and removal of temporary erosion control features, will be included in the Contract unit prices for the item or items to which such costs are related.

Separate payment will not be made for the cost of constructing temporary earth berms along the edges of the roadways to prevent erosion during grading and subsequent operations. Contractor must include these costs in the Contract prices for earthwork items.

Additional temporary erosion control features constructed as directed by Engineer will be paid for as unforeseeable work.

In case of repeated failure on the part of Contractor to control erosion, pollution, or siltation, Engineer reserves the right to employ outside assistance or to use the Department's own forces to provide the necessary corrective measures. Any such costs incurred, including engineering costs, will be charged to Contractor and appropriate deductions made from the monthly progress estimate.

Payment will be made under:

104-20 Abandon Existing Septic Tank System

105 CONTRACTOR QUALITY CONTROL GENERAL REQUIREMENTS (REV. 08-23-12)

A. General.

Submit to Engineer a meeting the requirements stipulated in this Article and that addresses the transportation, storage, placement, sampling, inspection of Contract materials and related construction operations; and to ensure that all work and material incorporated into the Project meet the requirements of the Contract Documents.

Comply with all personnel qualification requirements stipulated in this Article and elsewhere in the Contract Documents.

B. Guidelines for Development of the CQCP

Use the following guidelines for developing the CQCP and include other additional items as necessary.

- a. General. Provide detailed policies, methods and procedures to ensure the specified quality of all applicable materials and related production and field operations.
- b. Process control testing. List the material to be tested by pay item, tests to be conducted, the location of sampling, and the frequency of testing.
- c. Inspection/control procedures. Address each of the following subjects in each phase of construction:
 - 1) Preparatory phase.
 - a) Review all Contract requirements.
 - b) Ensure compliance of component material to the Contract requirements.
 - c) Coordinate all submittals including certifications.
 - d) Ensure capability of equipment and personnel to comply with the Contract requirements.
 - e) Ensure preliminary testing is accomplished.
 - f) Coordinate surveying and staking of the work.
 - 2) Start-up phase.
 - a) Review the Contract requirements with personnel performing the work.
 - b) Inspect start-up of work.
 - c) Establish standards of workmanship.
 - d) Provide training as necessary.
 - e) Establish detailed testing schedule based on the production schedule.
 - 3) Production phase.
 - a) Conduct intermittent or continuous inspection during construction to identify and correct deficiencies.
 - b) Inspect completed work before requesting Engineer inspection acceptance.
 - c) Provide feedback and system changes to prevent repeated deficiencies.
- d. Description of records. List the records to be maintained.
- e. Personnel qualifications.
 - 1) Identify the primary contact that will communicate with the Department. Identify roles and responsibilities of the personnel involved in the

Quality Control (QC) process. Document the name, authority, relevant experience, and qualifications of person with overall responsibility for the inspection system.

- 2) Document the names, authority, and relevant experience of all personnel directly responsible for inspection and testing.
 - 3) Submit the Training Identification Numbers (TINs) or any other information which will be traceable to the certification agency's training location and dates for all technicians performing sampling, testing and inspection for both field and laboratory tests. Provide the names of the Florida Department of Transportation's Construction Training and Qualification Program (CTQP) certifications and other pertinent certifications held and the expiration dates for each certification for each technician. Include employed and subcontracted technicians.
- f. Subcontractors.
 - 1) Include the work of all subcontractors.
 - 2) If a subcontractor is to perform work subject to the requirements of this Article, detail how that subcontractor will interface with Contractor's and other subcontractor's organizations.
 - g. Raw Materials:
 - 1) Source: Identify the sources of raw materials. Provide locations and plant or mine numbers when applicable. Include the mailing address, physical address including county of the plant, telephone and fax numbers, E-mail address, primary contact at the plant, responsible person in charge, facility number provided by the FDOT, Owner information and Vendor Number and other information as required.
 - 2) Certification: Describe methods of verifying compliance of certification with the Specifications.
 - 3) Disposition of Failing Materials: Describe the system for controlling non-conforming materials, including procedures for identification, isolation and disposition.
 - 4) Storage Facilities for Raw Materials: Describe measures and methods, including bedding details, for preventing segregation, contamination and degradation.
 - 5) Describe methods of identifying individual materials. Where applicable, submit a site plan showing the locations of various materials.
 - h. Production Equipment: Describe calibration frequencies, maintenance schedule and procedures for production equipment.
 - i. Other Requirements:
 - 1) Copy of Certification: Attach certifications issued by the plant/Contractor for the products approved by the FDOT that will be used in the Project.
 - 2) Statement of Compliance: Include a statement of compliance with all quality requirements set forth by the Department in the Contract Documents.

3) Information on Producers with Accepted FDOT Quality Control Programs: All producers of materials listed herein in Subarticle 105-G.1 must have FDOT accepted QC Programs and be listed on the FDOT's List of Producers with Accepted QC Programs. Identify the Producers of materials for the Project and include the FDOT's Facility Id number as part of the identification.

4) Describing Documentation Procedure: Identify location of document storage to enable Department review. Include QC charts, qualification/accreditation records, inspection reports, and other pertinent/supporting documents for an approved CQCP.

j. Final Manufactured Product - Plant Operations: Describe inspection schedule and methods for identifying defects and non-compliance with the specifications. Describe corrective actions and methods to resolve them.

1) Storage: When storage of the produced materials is required and it is not defined in the Contract Documents, describe the methods and duration for storage. Include measures and methods for preventing segregation, contamination and degradation during storage.

2) Disposition of Failing Materials: When not described in the specifications, describe the methods and measures for identifying and controlling the failing materials. Include preventive and corrective measures. Describe disposition of failing materials.

k. Final Manufactured Product - Field Operations:

1) Transportation: Describe the method of delivery from the point of production/storage to the point of placement.

2) Storage: When storage of the produced materials is required and it is not defined in the Contract Documents, describe the methods and duration for storage. Include measures and methods for preventing segregation, contamination and degradation during storage.

3) Placement: Describe the methods and identify the type of equipment used in incorporation of the materials into the project.

4) Disposition of Failing Materials: When not described in the specifications, describe the methods and measures for identifying and controlling the failing materials. Include preventive and corrective measures. Describe disposition of failing materials.

C. Quality Control Plan Submittal.

Submit the CQCP to Engineer for approval within 21 days after the Contract Award or at the Preconstruction Conference, whichever is sooner. Do not incorporate materials into the Project or begin any work subject to the CQCP prior to Engineer's acceptance of the CQCP.

Modifications or additions may be required to any part of the CQCP that is not adequately covered. Acceptance of the CQCP will be based on the inclusion of the required

information. Acceptance does not imply any warranty by the County that the CQCP will result in consistent contract compliance. It remains the responsibility of Contractor to demonstrate such compliance.

If at any time Contractor is not in compliance with the approved CQCP, or a part thereof, affected portions of the CQCP will be disapproved. Cease work in the affected operation(s) and submit a revision to Engineer. If the CQCP, or a part thereof, must be revised, submit the revision to Engineer. Engineer will review the revision and respond within seven calendar days of receipt.

Continue to work on operations that are still in compliance with the approved sections of the CQCP.

As work progresses, submit to Engineer for acceptance supplementary documentation to the CQCP whenever quality control or quality control personnel changes are necessary.

D. Quality Control Documentation.

Maintain complete testing and inspection records by pay item number and make them accessible to Engineer. When or where required, submit the record and certification within one working day of the work being performed. If the record is incomplete, in error, or otherwise misleading, a copy of the record will be returned with corrections noted. When chronic errors or omissions occur, correct the procedures by which the records are produced.

Submission of Materials Certification and Reporting Test Results: Provide certifications prior to placement of materials. Report test results at completion of the test and meet the requirements of the applicable Specifications.

Worksheets: Make available to the Department, when requested, worksheets used for collecting test information. Ensure the worksheets at a minimum contain the following:

- a. Project Identification Number,
- b. Time and Date,
- c. Laboratory Identification and Name,
- d. Training Identification Numbers (TIN) and initials,
- e. Record details as specified within the test method.

Inspections to Assure Compliance with Acceptance Criteria.

- f. General: The Department is not obligated to make an inspection of materials at the source of supply, manufacture, or fabrication.
- g. Quality Control Inspection: Provide all necessary inspection to assure effective Quality Control of the operations related to materials acceptance. This includes but is not limited to sampling and testing, production, storage, delivery, construction and placement. Ensure that the equipment used in the production and testing of the materials provides accurate and precise measurements in accordance with the applicable Specifications. Maintain a record of all inspections, including but not limited to, date of inspection, results of inspection, and any subsequent corrective actions taken. Make available to the Department the inspection records, when requested.

h. Notification of Placing Order:

- 1) Order materials sufficiently in advance of their incorporation in the work to allow time for sampling, testing and inspection. Notify Engineer, prior to placing orders for materials.
- 2) Submit to Engineer a fabrication schedule for all items requiring commercial inspection, before or at the preconstruction meeting. These items include, but are not limited to steel bridge components, overhead cantilevered sign supports with cantilevered arms exceeding 41 feet, moveable bridge components or any other item identified as an item requiring commercial inspection in the Contract Documents.
- 3) Notify Engineer at least 30 days before beginning any production and include a production schedule.

E. Contractor Certification of Compliance.

Provide Engineer with a notarized monthly certification of compliance with the requirements of this Article, to accompany each progress estimate, on a form acceptable by Engineer. The Department may not authorize payment of any progress estimate not accompanied by an executed certification document.

Final payment will not be made until a final notarized certification summarizing all QC exceptions has been submitted.

F. Personnel Qualifications.

General:

- a. Provide qualified personnel for sampling, testing and inspection of materials and construction activities. Ensure that qualifications are maintained during the course of sampling, testing and inspection.
- b. Construction operations that require a qualified technician must not begin until Engineer verifies that the technician is on the FDOT CTQP list of qualified technicians.

QC Manager:

- c. Designate a QC Manager who has full authority to act as Contractor's agent to institute any and all actions necessary for the successful implementation of the CQCP. The QC Manager must speak and understand English. The QC Manager must be on-site at the Project on a daily basis or always available upon four hours notice to administer the CQCP. This includes administering, implementing, monitoring, and as necessary, adjusting the processes to ensure compliance with the Contract Documents. Ensure that the QC Manager is qualified as such through the FDOT CTQP.
- d. Under the direction of the QC Manager, and using standard forms approved by Engineer, summarize the daily QC activities including testing and material sampling. Since erasures are strictly prohibited on all reports and forms, use blue or colored ink. Do not use black ink. If manual corrections to original data are necessary, strike through, correct, and date the entry, including the initials of the person making the correction. Make copies of the completed forms

available for the Department to review daily unless otherwise required in the specifications. Maintain all QC related reports and documentation for a period of three years from final acceptance of the Project. Make copies available for review by the Department upon request.

Worksite Traffic Supervisor:

- e. Provide a Worksite Traffic Supervisor who is responsible for initiating, installing, and maintaining all traffic control devices as described in Article 102 (Maintenance of Traffic) and in the Contract Documents. Ensure that the Worksite Traffic Supervisor is certified in the advanced training category by a FDOT approved training Provider. Approved Providers will be posted on the FDOT's website at the following URL address:

1) <http://www.dot.state.fl.us/rddesign/MOT/MOT.shtm>

- f. Use approved alternate Worksite Traffic Supervisors when necessary.

Flagger: Provide trained flaggers to direct traffic where one-way operation in a single lane is in effect and in other situations as required. The Worksite Traffic Supervisor or others as approved by the Department will provide training for flaggers.

Earthwork Quality Control Personnel:

- g. Earthwork Level I: Ensure the technician who samples soil and earthwork materials from the roadway project, takes earthwork moisture and density readings, and records those data in the Density Log Book holds a CTQP Earthwork Construction Inspection Level I qualification.
- h. Earthwork Level II: Ensure the technician responsible for determining the disposition of soil and earthwork materials on the roadway, and for interpreting and meeting Contract Document requirements holds a CTQP Earthwork Construction Inspection Level II qualification.

Asphalt Quality Control Personnel:

- i. Plant Technicians: For asphalt plant operations, provide a QC technician, qualified as a CTQP Asphalt Plant Level II technician, available at the asphalt plant at all times when producing mix for the Department. Perform all asphalt plant related testing with a CTQP Asphalt Plant Level I technician. As an exception, measurements of temperature may be performed by someone under the supervision of a CTQP Plant Level II technician.
- j. Paving Technicians: For paving operations (with the exception of miscellaneous or temporary asphalt), keep a qualified CTQP Asphalt Paving Level II technician on the roadway at all times when placing asphalt mix for the Department, and perform all testing with a CTQP Asphalt Paving Level I technician. As an exception, measurements of cross-slope, temperature, and yield (spread rate) can be performed by someone under the supervision of a CTQP Paving Level II technician at the roadway.
- k. Mix Designer: Ensure all mix designs are developed by individuals who are CTQP qualified as an Asphalt Hot Mix Designer.

- I. Documentation: Document all QC procedures, inspection, and all test results and make them available for review by Engineer throughout the life of the Contract. Identify in the asphalt producer's Quality Control Plan the Quality Control Manager(s) and/or Asphalt Plant Level II technician(s) responsible for the decision to resume production after a quality control failure.

Concrete QC Personnel:

- m. Concrete Field Technician - Level I: Ensure technicians performing plastic property testing on concrete for materials acceptance are qualified CTQP Concrete Field Technicians Level I. Plastic property testing will include but not be limited to slump, temperature, air content, water-to-cementitious materials ratio calculation, and making and curing concrete cylinders. Duties will include initial sampling and testing to confirm specification compliance prior to beginning concrete placements, ensuring timely placement of initial cure and providing for the transport of compressive strength samples to the designated laboratories.
- n. Concrete Field Inspector - Level II: Ensure field inspectors responsible for the quality of concrete being placed on major bridge projects are qualified CTQP Concrete Field Inspectors Level II. A Level II Inspector must be present on the jobsite during all concrete placements. Prior to the placement of concrete, the inspector will inspect the element to be cast to ensure compliance with Contract Documents. A Level II Inspector's duties may include ensuring that concrete testing, inspection, and curing in the field are performed in accordance with the Contract Documents. The QC Inspector will inform the Verification Inspector of anticipated concrete placements and LOT sizes.
- o. Concrete Laboratory Technician:
 - 1) Concrete Laboratory Technician - Level I: Ensure technicians testing cylinders and recording concrete strength for material acceptance are qualified CTQP Concrete Laboratory Technicians Level I. Duties include final curing, compressive strength testing, and the recording/reporting of all test data.
 - 2) Concrete Laboratory Technician – Level II: Ensure that laboratories providing hardened property test results to the Department are under the supervision of a CTQP Concrete Laboratory Technician - Level II. This person is responsible to ensure that the tests are performed in accordance with Standard Test Methods, project specifications and other contract documents.

Supervisory Personnel – Post-Tensioned and Movable Bridge Structures:

- p. General: Provide supervisory personnel meeting the qualification requirements only for the post-tensioned and movable bridge types detailed in this Article. Submit qualifications to Engineer at the pre-construction conference. Do not begin construction until the qualifications of supervisory personnel have been approved by Engineer.
- q. Proof of License or Certification:

- 1) Submit a copy of the Professional Engineer license current and in force issued by the state in which registration is held. The license must be for the field of engineering that the construction work involves such as Civil, Electrical or Mechanical. Under certain circumstances Florida registration may be required.
- 2) Submit a copy of the license issued by the State of Florida for tradesmen that require a license indicating that the license is in force and is current. Submit a copy of the certification issued by the Instrumentation, Systems and Automation Society of America for each Certified Control Systems Technician.
- r. Experience Record: Submit the following information for supervisory personnel to substantiate their experience record. The supervisor (project engineer, superintendent/manager or foreman) seeking approval must provide a notarized certification statement attesting to the completeness and accuracy of the information submitted. Provide the following experience information for each individual seeking approval as a supervisor:
 - 1) Project owner's name and telephone number of an owner's representative, project identification number, state, city, county, highway number and feature intersected.
 - 2) Provide a detailed description of each bridge construction experience, and the level of supervisory authority during that experience. Report the duration in weeks, as well as begin and end dates, for each experience period.
 - 3) Provide the name, address and telephone number of an individual that can verify that the experience being reported is accurate. This individual should have been an immediate supervisor unless the supervisor cannot be contacted in which case another individual with direct knowledge of the experience is acceptable.
- s. Concrete Post-Tensioned Segmental Box Girder Construction: Ensure the individuals filling the following positions meet the minimum requirements as follows:
 - 1) Project Engineer-New Construction: Ensure the Project Engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure a minimum of three years of experience is in Segmental Box Girder Construction Engineering and includes a minimum of one year in segmental casting yard operations and related surveying, one year in segment erection and related surveying, including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the Project Engineer in responsible charge of Segmental Box Girder Construction Engineering. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.
 - 2) Project Engineer-Repair and Rehabilitation: Ensure the Project Engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure a minimum of three years of

- experience is in Segmental Box Girder Construction Engineering and includes one year of post-tensioning and grouting of longitudinal tendons and a minimum of one year as the Project Engineer in responsible charge of Segmental Box Girder rehabilitation engineering or Segmental Box Girder new construction engineering.
- 3) Project Superintendent/Manager - New Construction:
 - a) Ensure the Project Superintendent/Manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in Segmental Box Girder construction operations and includes a minimum of one year in the casting yard operations and related surveying, one year in segment erection and related surveying including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the Project
 - b) Superintendent/Manager in responsible charge of Segmental Box Girder construction operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.
 - 4) Project Superintendent/Manager-Repair and Rehabilitation: Ensure the Project Superintendent/Manager has a minimum of five years of bridge construction experience or is a registered Professional Engineer with three years of bridge construction experience. Ensure that a minimum of two years of experience is in Segmental Box Girder construction operations and includes a minimum of one year experience performing post-tensioning and grouting of longitudinal tendons and a minimum of one year as the Project Superintendent/Manager in responsible charge of Segmental Box Girder rehabilitation operations or Segmental Box Girder new construction operations.
 - 5) Foreman-New Construction: Ensure that the Foreman has a minimum of five years of bridge construction experience with two years of experience in Segmental Box Girder Operations and a minimum of one year as the foreman in responsible charge of Segmental Box Girder new construction Operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.
 - 6) Foreman-Repair and Rehabilitation: Ensure the Foreman has a minimum of five years of bridge construction experience with two years of experience in Segmental Box Girder Operations and a minimum of one year as the foreman in responsible charge of Segmental Box Girder rehabilitation operations or Segmental Box Girder new construction operations.
 - 7) Geometry Control Engineer/Manager:
 - a) Ensure that the Geometry Control Engineer/Manager for construction of cast-in-place box segments is a registered Professional Engineer with one year of experience, a non-registered Engineer with three years of experience or a Registered Professional Land Surveyor with three years of experience in geometry control for casting and erection of cast-in-place box segments. Credit for experience in cast-in-place box girder geometry control will be given for experience in precast box girder geometry control but not vice versa.
 - b) Ensure that the Geometry Control Engineer/Manager for precast box segments is a registered Professional Engineer with one year of experience or non-registered with three years of experience in casting yard geometry control of concrete box segments.
 - c) The Geometry Control Engineer/Manager must be responsible for and experienced at implementing the method for establishing and maintaining geometry control for segment casting yard operations and segment erection operations and must be experienced with the use of computer programs for monitoring and adjusting theoretical segment casting curves and geometry. This individual must be experienced at establishing procedures for assuring accurate segment form setup, post-tensioning duct and rebar alignment and effective concrete placement and curing operations as well as for verifying that casting and erection field survey data has been properly gathered and recorded. Ensure this individual is present at the site of construction, at all times while cast-in-place segmental box girder construction is in progress or until casting yard operations and segment erection is complete.
 - 8) Surveyor: Ensure that the Surveyor in charge of geometry control surveying for box segment casting and/or box segment erection has a minimum of one year of bridge construction surveying experience. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.
 - t. Movable Bridge Construction: Ensure the individual filling the following positions meet the minimum requirements as follows:
 - 1) Electrical Journeyman: Ensure the Electrical Journeyman holds, an active journeyman electrician's license and has at least five years experience in industrial electrical work, or is a Certified Control Systems Technician. A Certified Control Systems Technician will not be permitted to perform electrical power work including, but not limited to, conduit and wire-way installation or power conductor connection. Ensure the electrical journeyman has successfully completed the installation of one similar movable bridge electrical system during the last three years.
 - 2) Control Systems Engineer and Mechanical Systems Engineer: Ensure the Control Systems

Engineer and Mechanical Systems Engineer are both registered Professional Engineers with a minimum of 10 years supervisory experience each in movable bridge construction. Ensure the engineers have working knowledge of the movable bridge leaf motion control techniques, mechanical equipment and arrangements specified for this project. Ensure that each Engineer has been in responsible control of the design and implementation of at least three movable bridge electrical control and machinery systems within the past 10 years of which, at least one of the three bridges was within the last three years. Ensure that a minimum of one of the three bridge designs incorporated the same type of leaf motion control and machinery systems specified for this project.

u. Concrete Post-Tensioned Other Than Segmental Box Girder Construction: Ensure the individual filling the following positions meet the minimum requirements as follows:

- 1) Project Engineer: Ensure the Project Engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in concrete post-tensioned construction. Ensure that the three years of experience includes experience in girder erection, safe use of cranes, stabilization of girders; design of false work for temporary girder support, post-tensioning and grouting operations, and a minimum of one year as the Project Engineer in responsible charge of post-tensioning related engineering responsibilities.
- 2) Project Superintendent/Manager: Ensure the Project Superintendent/Manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience and has a minimum of three years of supervisory experience in girder erection, safe use of cranes, stabilization of girders; design of falsework for temporary girder support post-tensioning, grouting operations and a minimum of one year as the Project Superintendent/Manager in responsible charge of post-tensioning related operations.
- 3) Foreman: Ensure the Foreman has a minimum of five years of bridge construction experience with two years of experience in post-tensioning related operations and a minimum of one year as the foreman in responsible charge of post-tensioning related operations.

v. Post-Tensioning (PT) and Grouting Personnel Qualifications: Perform all stressing and grouting operations in the presence of Engineer and with personnel meeting the qualifications of this article. Coordinate and schedule all PT and grouting activities to facilitate inspection by Engineer.

- 1) Post-Tensioning: Perform all PT field operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the post-tensioning work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I

girder construction, provide at least two CTQP qualified PT technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified PT Technician, may also be a work crew member, in which case, the supervisor shall count as one of the two CTQP qualified work crew members. For PT operations other than the superstructures of post-tensioned box or I girder construction, perform all PT operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the PT work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

2) Grouting:

- a) Perform all grouting field operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP qualified grouting technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified Grouting Technician, may also be a work crew member, in which case, the supervisor shall count as one of two CTQP qualified work crew members.
- b) For grouting operations other than the superstructures of post-tensioned box or I girder construction, perform all grouting operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.
- c) Perform all vacuum grouting operations under the direct supervision of a crew foreman who has been trained and has experience in the use of vacuum grouting equipment and procedures. Submit the crew foreman's training and experience records to Engineer prior to performing any vacuum grouting operation.

w. Failure to Comply with Bridge Qualification Requirements:

- 1) Make an immediate effort to reestablish compliance. If an immediate effort is not put forth as determined by Engineer, payment for the bridge construction operations requiring supervisors to be qualified under this Specification will be withheld up to 60 days. Cease all bridge construction and related activities (casting yard, etc.) if compliance is not met within 60 days, regardless of how much effort is put forth. Resume bridge construction operations only after written approval from Engineer stating that compliance is reestablished.

Prestressed Concrete Plant Quality Control Personnel:

- x. Ensure each prestressed concrete plant has an onsite production manager, an onsite Plant Quality Control Manager, a Plant engineer, and adequate onsite QC

inspectors/technicians to provide complete QC inspections and testing.

- y. Ensure the Plant Manager for QC has at least five years of related experience and a current PCI QC personnel Level III certification and a certificate of completion of FDOT Section 450 Specification examination. Ensure that the QC inspector/technician has current PCI QC Technician/Inspector Level II certification and a certificate of completion of FDOT Section 450 Specification examination.
- z. Ensure that the batch plant operators of the ready mixed concrete batch plants meet the requirements of Section 9.2 of the FDOT Materials Manual. Ensure that the batch plant operators of the onsite centrally mixed concrete plants meet the training requirements of Subarticle 105-F.11.b.4) b) below.

Signal Installation Inspector:

- aa. Provide an inspector trained and certified by the International Municipal Signal Association (IMSA) as a Traffic Signal Inspector to perform all signal installation inspections. Use only Department approved signal inspection report forms during the signal inspection activities.
- bb. Ensure all equipment, materials, and hardware is in compliance with Department Specifications and verify that all equipment requiring certification is listed on the PWWM Traffic Signals And Signs Qualified Products List (TSSQPL) <http://www.miamidade.gov/qpl/>.
- cc. Provide the completed signal inspection report form(s), certified by the IMSA Traffic Signal Inspector to Engineer. Sample forms are available at the FDOT webpage <http://www.dot.state.fl.us/trafficoperations> address:

Pipe and Precast Concrete Products Manufacturing Facilities Quality Control Personnel:

- dd. General: Obtain personnel certifications from FDOT accredited training providers. The list of FDOT approved courses and their accredited providers is available on the State Materials Office website.
- ee. Precast Concrete Drainage Structures, Precast Concrete Box Culvert, Precast Concrete Pipe, Incidental Precast Concrete, and Flexible Pipe Manufacturing Facilities Quality Control Personnel:

- 1) Level I Quality Control Inspectors: Ensure that the Level I Inspectors have completed a minimum of a 12-hour, Department approved, Level I QC Inspector training course in the respective work area. As an exception to this, ensure Flexible Pipe Level I QC Inspectors have completed a minimum of an 8-hour, Department approved, Level I QC Flexible Pipe Inspector training course. For Incidental Precast Concrete, as an alternative to the completion of the 12-hour training course, the Department will accept QC personnel meeting the requirements of Subarticle 105-F.11.b.4)a) below and CTQP Concrete Field Technician level I certification or Precast/Prestressed Concrete Institute (PCI) Quality Control Technician/Inspector Level II certification.

- 2) Level II Quality Control Inspectors: Ensure that Level II Inspectors have completed FDOT approved Level I QC Inspector training and a minimum of a 5-hour, FDOT approved, Level II QC Inspector training course in the respective work areas. For Incidental Precast Concrete, as an alternative to the completion of the 5-hour training course, the Department will accept CTQP Concrete Field Technician Level II or PCI Quality Control Level III certifications.

- 3) Plant Quality Control Manager: Ensure that QC Manager has completed FDOT approved Level II QC Inspector training and has a minimum of 2 years construction related experience in the specific work area.

- 4) Additional Requirements for Quality Control Personnel of Precast Concrete Drainage, Precast Concrete Box Culvert, and Incidental Precast Concrete Manufacturing Facilities:

- a) Testing Personnel: Ensure the personnel performing plastic property tests have ACI Concrete Field Testing Technician-Grade I certification. Ensure the personnel performing laboratory compressive strength testing have ACI Concrete Laboratory Testing Technician-Grade 1 certification or ACI Concrete Strength Testing Technician certification.
- b) Batch Plant Operator: Ensure the concrete batch plant operator is qualified as a CTQP Concrete Batch Plant Operator. As an alternative to CTQP qualification, the Department will accept the completion of a minimum of a 6-hour, FDOT approved, Batch Plant Operator training course.

Structural Steel and Miscellaneous Metals Fabrication Facility Quality Control Personnel:

- ff. Ensure each fabrication facility has an onsite production manager, an onsite facility manager for QC, a plant engineer, and on site QC inspectors/technicians to provide complete QC inspections and testing.
- gg. Ensure that the Facility Manager for QC and QC inspectors/technicians meet the certification requirements set forth in the latest version of AASHTO/NSBA Steel Bridge Collaboration S 4.1, Steel Bridge Fabrication QC/QA Guide Specification, including the years of experience required in Table 105-1 below. The Facility Manager for QC must meet the requirements of Table 105-1 for every Structural Steel Member Type produced by a plant with QC being managed by the Facility Manager for QC. The Facility Manager for QC will report directly to the plant manager or plant engineer and must not be the plant production manager nor report to or be the subordinate of the plant production manager. QC inspectors/technicians must be the employees of, and must report directly to the Facility Manager for QC.

TABLE 105-1 Experience Requirements for QC Inspectors/Technicians And Facility Manager for Quality Control

Structural Steel Member Type	Minimum Years of Experience Required	
	QC Inspector/Technician	Facility Manager for QC
Rolled beam bridges	1 year	3 years
Welded plate girders (I sections, box sections, etc.)	2 years	4 years
Complex structures, such as trusses, arches, cable stayed bridges, and moveable bridges	3 years	5 years
Fracture critical (FC) members	3 years	5 years

G. FDOT Quality Control Program.

Producers for the following materials must have an accepted FDOT Quality Control Program during the production of materials to be used on Department projects and be currently listed in the FDOT Materials/Producer Listings and must meet and maintain the approved FDOT Quality Control Program requirements at all times while producing materials that will be incorporated into the Project

(<http://www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/materialslistings/postjuly2002.shtm>):

- Aggregate
- Asphalt Mix
- Cementitious Material
- Drainage Products
- Earthwork
- Galvanize Metal Products
- Portland Cement Concrete (Structural)
- Prestress/Precast Concrete Products
- Steel and Miscellaneous Metal
- Timber

When accreditation or certification is required, make supporting documents from the two previous inspections performed by the accrediting or certifying agency available to the Department upon request.

Prestressed Concrete Quality Control Program: Ensure that prestressed concrete plants participating in the FDOT's Acceptance Program are qualified. Obtaining qualification requires a current certification from a FDOT approved precast prestressed concrete plant certification agency and a FDOT approved Quality Control Plan. The list of FDOT approved certification agencies is available on the website of the FDOT State Materials Office.

Steel and Miscellaneous Metals Quality Control Program:

- Ensure that the fabricators of Steel and miscellaneous metal products participating in the FDOT's Quality

Control Acceptance Program are qualified. Obtaining qualification requires an accepted FDOT Quality Control Plan. A current American Institute for Steel Construction (AISC) certification is a requirement for the Quality Control Acceptance Program of the steel and miscellaneous metal fabricators, provided that AISC certification program is available for the category of the fabrication products.

- Steel and Miscellaneous Metal products, including aluminum, are defined as the metal components of bridges, including pedestrian and moveable bridges, overhead and cantilevered sign supports, ladders and platforms, bearings, end wall grates, roadway gratings, drainage items, expansion joints, roadway decking, shear connectors, handrails, galvanized products, fencing, guardrail, light poles, high mast light poles, standard mast arm assemblies and Monotube assemblies, stay in-place forms, casing pipe, strain poles, fasteners, connectors and other hardware.

107 LITTER REMOVAL AND MOWING (REV. 11-25-2015)

H. Description.

Contractor to be responsible for the work below in areas where the County or the property owner has restricted or limited access to maintain the property.

- Provide pickup, removal and disposal of litter within the project limits from the outside edge of travel way to the right of way line. Include the median on divided highways, from the inside edge of travel way to the inside edge of travel way. Litter includes; but is not limited to, bottles, cans, paper, tires, tire pieces, lumber, vehicle parts, metal junk, and brush debris. Exclude any inaccessible areas or areas identified in the Plans as new landscaping in accordance with the Contract Documents.
- Mow turf or vegetation within the project limits. Turf consists of grasses planted in accordance with FDOT Section 570. Vegetation consists of planted and natural grasses, weeds, and other natural vegetation that have been previously mowed. Exclude any areas identified in the Plans as new landscaping in accordance with the Contract Documents.

I. Operation.

Frequency:

- Remove litter daily from the beginning of the project until final completion, unless otherwise directed by the Engineer. Continue litter removal until final acceptance.
- Begin mowing when directed by the Engineer and continue per the frequency agreed, (every month or less depending of the weather season) unless otherwise directed by the Engineer. Mow all areas to obtain a uniform height of 6 inches. Maintain turf and vegetation height between 6 inches and 12 inches. Do not include seed stalk or wildflowers when measuring height. Continue mowing until final acceptance. After final acceptance perform litter removal and mowing

until new turf is established in accordance with FDOT 570-4 at no cost to the County.

- c. Perform litter removal prior to and in conjunction with mowing; however, the Engineer may direct litter pickups in addition to those performed in conjunction with mowing. Do not mow new turf until a healthy root system is established. In designated wildflower areas, avoid cutting wildflowers when in bloom and when re-seeding.

General:

- d. Mow shoulders and medians concurrently so that not more than one mile will be left partially mowed at the conclusion of the working day. Mow turf and vegetation on slopes or around appurtenances concurrent with the mowing operation. In areas saturated with standing water, mow or cut to the surface of the water using hand labor or other specialized equipment when standard equipment will cause damage. Do not remove turf or other vegetation cuttings from the right-of-way, or rake or pick up the cuttings unless the cuttings are in the traveled ways, bike lanes, or sidewalk; are obstructing drainage structures; or are the result of cleaning the equipment.

Limitations:

- e. Maintain traffic in accordance with Article 102-Maintenance of Traffic. When mowing within four feet of a travel lane, operate the equipment in the same direction of traffic, unless the adjacent lane is closed to traffic due to construction operations. Perform all work during daylight hours.

Disposal of Litter and Debris:

- f. During each litter removal cycle, bag and remove all litter or piles at the end of each working day. Dispose of litter in accordance with applicable local and state laws. Do not store or stockpile litter within the project limits.

J. Method of Measurement.

No measure is included for litter removal or mowing.

K. Basis of Payment.

All work and incidental costs specified as being covered under this Article will be included for payment under the several scheduled items of the overall Contract, and no separate payment will be made.

110 CLEARING AND GRUBBING (REV. 05-16-11)

A. General.

Perform all Clearing and Grubbing required by the Contract Documents or necessary to prepare the Project site for the proposed construction.

Remove and dispose of all structures, material, product and debris not required to be salvaged or not required to complete the construction.

Trim trees and shrubs within the Project right-of-way that are required by the Contract Documents or necessary for the construction of the Project.

Perform the work and meet all the requirements for the miscellaneous operations described in Subarticle B.6 herein.

Protect and do not displace structures which are to remain in place.

B. Clearing and Grubbing:

Standard Clearing and Grubbing.

- a. Perform Standard Clearing and Grubbing within:
 - 1) Right-of-way of the roadway to be constructed.
 - 2) All Project areas, whether or not shown in the Plans, that require Clearing and Grubbing including:
 - a) Areas where excavation is to be done.
 - b) Areas where roadway embankments will be constructed.
 - c) Areas where structures will be constructed or installed.
- b. Work includes complete removal and disposal of:
 - 1) All buildings, structures, appurtenances, existing pavement, trees, plants, vegetation, timber, brush, stumps, roots, rubbish, debris, and all other obstructions resting on or protruding through the surface of the existing ground and the surface of excavated areas.
 - 2) All other structures and obstructions necessary to be removed and for which other items of the Contract do not specify the removal thereof.
 - 3) Any boulders encountered in the roadway excavation or found on the surface of the ground unless otherwise permitted by the Contract Documents
- c. Depths of Removal of Roots, Stumps, and Other Debris:
 - 1) Completely remove and dispose of all stumps found within the roadway right-of-way.
 - 2) Remove roots and other debris from all excavated material to be used in the construction of roadway embankment.
 - 3) In all areas where excavation is to be performed or roadway embankments are to be constructed, plow the surface to a depth of at least 6 inches, and remove roots and other debris to a depth of 12 inches below the ground surface.
 - 4) Remove all roots and other debris protruding through or appearing on the surface of the completed excavation within the roadway area and for structures, to a depth of at least 12 inches below the finished excavation surface.
 - 5) In borrow pits, material pits, and lateral ditches, remove or cut off all stumps, roots, etc. below the surface of the completed excavation. Do not

perform any clearing or grubbing within 3 feet inside the right-of-way line in borrow and material pits.

- 6) Within all other areas where Standard Clearing and Grubbing is to be performed, remove roots and other debris projecting through or appearing on the surface of the original ground to a depth of 12 inches below the surface, but do not plow or harrow these areas.

d. Trees to Remain:

- 1) As an exception to the above provisions, where so directed by the Engineer, trim, protect, and leave standing desirable trees within the Project area.
- 2) Trim branches of trees extending over the area occupied by the roadway as directed, to give a clear height of 16 feet above the roadway.

Selective Clearing and Grubbing.

- e. Perform Selective Clearing and Grubbing only in areas so designated in the Plans or where directed by the Engineer.
- f. Completely remove and dispose of stumps and remove and dispose of all vegetation, obstructions, etc., as required for Standard Clearing and Grubbing except that, where so elected, the Contractor may cut roots flush with the ground surface.
- g. Entirely remove undergrowth except in specific areas designated by the Engineer to remain for aesthetic purposes.
- h. Trim, protect, and leave standing desirable trees, with the exception of such trees as the Engineer may designate to be removed in order to facilitate right-of-way maintenance. Remove undesirable or damaged trees as so designated by the Engineer.

Removal of Buildings.

- i. Completely remove all parts of the buildings, including utilities, plumbing, foundations, floors, basements, steps, connecting concrete sidewalks or other pavement, septic tanks, and any other appurtenances, by any practical manner which is not detrimental to other property and improvements. Remove utilities to the point of connection to the utility authority's cut-in.
- j. After removing the sewer connections to the point of cut-in, construct a concrete plug at the cut-in point, as directed by the Engineer, except where the utility owners may elect to perform their own plugging. Contact the appropriate utility companies prior to removal of any part of the building to ensure disconnection of services.
- k. Removal by Others: Where buildings within the area to be cleared and grubbed are so specified to be removed by others, remove and dispose of any foundations, curtain walls, concrete floors, basements or other foundation parts which might be left in place after such removal of buildings by others.

Removal of Existing Structures.

l. Structures to be removed include:

- 1) Structures, or portions of structures, shown in the Plans to be removed;

- 2) Structures, or portions of structures, found within the areas requiring Clearing and Grubbing, and directed by the Engineer to be removed;
- 3) Structures, or portion of structures, which are necessary to be removed in order to construct new structures; and
- 4) All other appurtenances or obstructions which may be designated in the Contract Documents as to be included for removal under this Article.

m. Removal Requirements:

1) General:

- a) Remove and dispose of all materials from existing structures required to be removed.
- b) Remove the structures in a neat manner so as to leave no obstructions to any proposed new structures, construction, or to any waterways.
- c) Pull, cut off, or break off pilings to the requirements of the permit or other Contract Documents, whichever requires the deepest removal, but not less than 2 feet below the finish ground line.
- d) If Plans indicate channel excavation to be done by others, consider the finish ground line as the limits of such excavation.
- e) For materials which are to remain the property of the Department or are to be salvaged for use in temporary structures, avoid damage to such materials, and entirely remove all bolts, nails, etc. from timbers to be so salvaged.
- f) Mark structural steel members for identification as directed.

2) Removal of Steel Members With Hazardous Coatings:

- a) Provide to the Engineer for approval, a copy of the "Contractor's Lead in Construction Compliance Program" from the firm actually removing and disposing of these steel members before any members are disturbed.
- b) Vacuum power tool clean any coated steel member to bare metal as defined by SSPC-SP11 a minimum of 4 inches either side of any area to be heated (torch cutting, sawing, grinding, etc.) in accordance with 29 CFR 1926.354. Abrasive blasting is prohibited.
- c) Provide air supplied respirators in accordance with 29 CFR 1926.62 and 29 CFR 1910.134.

n. Partial Removal of Bridges:

- 1) For all demolition methods, submit for review and approval of the Engineer, a demolition plan that describes the method of removal, equipment to be used, types of rebar splices or couplers, and method of straightening or cutting rebars. In addition, for hydro-demolition, describe the method for control of water or slurry runoff and measures for safe containment of concrete fragments that are thrown out by the hydro-demolition machine.
- 2) Where concrete is to be removed to neat lines, use concrete saws or hydro-demolition methods

capable of providing a reasonably uniform cleavage face. If the equipment used will not provide a uniform cut without surface spalling, first score the outlines of the work with small trenches or grooves.

- 3) On concrete bridges to be partially removed and widened, remove concrete by manually or mechanically operated pavement breakers, by concrete saws, by chipping hammers, or by hydro-demolition methods. Do not use explosives.
- o. Authority of U.S. Coast Guard: For structures in navigable waters, when constructing the project under authority of a U.S. Coast Guard permit, the U.S. Coast Guard may inspect and approve the work to remove any existing structures involved therein, prior to acceptance by the Department.
- p. Asbestos Containing Materials (ACM) Not Identified Prior to the Work:
 - 1) When encountering or exposing any condition indicating the presence of asbestos, cease operations immediately in the vicinity and notify the Engineer.
 - 2) Make every effort to minimize the disturbance of the ACM. Immediately provide for the health and safety of all workers at the job site and make provisions necessary for the health and safety of the public that may be exposed to any potentially hazardous conditions. Provisions shall meet all applicable laws, rules or regulations covering hazardous conditions and will be in a manner commensurate with the gravity of the conditions.
 - 3) The Engineer will direct the Prime Contractor when operations may resume in the affected area.

Removal of Existing Concrete Pavement.

- q. Remove and dispose of existing rigid portland cement concrete pavement, sidewalk, slope pavement, ditch pavement, curb, and curb and gutter etc., where shown in the plans or ordered by the Engineer to be removed or where required because of the construction operations.
- r. The work under Removal of Existing Concrete Pavement does not include the removal of retaining walls, drainage structures and flexible asphalt pavement.

Miscellaneous Operations.

- s. Water Wells Required to be Plugged:
 - 1) Fill or plug all water wells within the right-of-way, including areas of borrow pits and lateral ditches that are not to remain in service, in accordance with applicable Water Management District rules or the Department of Environmental Protection regulations.
 - 2) Cut off the casing of cased wells at least 12 inches below the ground line or 12 inches below the elevation of the finished excavation surface, whichever is lower. Water wells, as referred to herein, are defined either as artesian or non-artesian, as follows:

a) An artesian well is an artificial hole in the ground from which water supplies may be obtained and which penetrates any water-bearing rock, the water in which is raised to the surface by natural flow or which rises to an elevation above the top of the water-bearing bed. Artesian wells are further defined to include all holes drilled as a source of water that penetrate any water-bearing beds that are a part of the artesian water system of Florida, as determined by representatives of the applicable Water Management District.

b) A non-artesian (water-table) well is a well in which the source of water is an unconfined aquifer. The water in a non-artesian well does not rise above the source bed.

- t. Landscape Areas: When certain areas of the right-of-way, outside of the limits of construction, are shown in the plans or designated by the Engineer to be landscaped, either under the construction Contract or at a later time, remove undesirable trees, stumps, undergrowth, and vegetation, as directed, and preserve and trim natural growth and trees as directed by the Engineer.
- u. Leveling Terrain: Within the areas between the limits of construction and the outer limits of clearing and grubbing, fill all holes and other depressions, and cut down all mounds and ridges. Make the area of a sufficient uniform contour so that the Department's subsequent mowing and cutting operations are not hindered by irregularity of terrain. Perform this work regardless of whether the irregularities were the result of construction operations or existed originally.
- v. Mailboxes: When the Contract Documents require furnishing and installing mailboxes, permit each owner to remove the existing mailbox. Work with the Local Postmaster to develop a method of temporary mail service for the period between removal and installation of the new mailboxes. Install the mailboxes in accordance with the Design Standards.

C. Ownership of Materials.

Except as may be otherwise specified in the Contract Documents, the Contractor shall take ownership of all buildings, structures, appurtenances, and other materials removed by him and shall dispose of them in accordance with subarticle D below.

D. Disposal of Materials.

General:

- a. Dispose of all debris, timber, stumps, brush, roots, rubbish, and other waste material resulting from clearing and grubbing in areas and by methods meeting the applicable requirements of all Local, State and Federal regulations.

Disposal of Treated Wood:

- b. Treated wood, including that which comes from bridge channel fender systems, must be handled and disposed of properly during removal.

- c. Treated wood should not be cut or otherwise mechanically altered in a manner that would generate dust or particles without proper respiratory and dermal protection.
- d. Treated wood must be disposed of in at least a lined solid waste facility or through recycling/reuse.
- e. Treated wood shall not be disposed by burning or placement in a construction and demolition (C&D) debris landfill.
- f. All compensation for the cost of removal and disposal of treated wood will be included in the Cost of Removal of Existing Structures when an item for direct payment is provided in the Contract. If an item of direct payment is not provided in the Contract, the aforementioned cost is included in the cost for Clearing and Grubbing or among the other items of work in the Contract.

Hazardous Materials/Waste:

g. General:

- 1) Handle, transport and dispose of hazardous materials in accordance with all Local, State and Federal requirements including the following:
 - a) SSPC Guide 7
 - b) Federal Water Pollution Control Act, and
 - c) Resource Conservation and Recovery Act (RCRA).
- 2) Accept responsibility for the collection, sampling, classification, packaging, labeling, accumulation time, storage, manifesting, transportation, treatment and disposal of hazardous waste, both solid and liquid. Separate all solid and liquid waste and collect all liquids used at hygiene stations and handle as hazardous materials/waste. Obtain written approval from the Engineer and required agencies for all hazardous materials/waste stabilization methods before implementation.
- 3) Obtain an EPA/FDEP Hazardous Waste Identification Number (EPA/FDEP ID Number) before transporting and/or disposal of any hazardous materials/waste.
- 4) List the Department as the generator of all hazardous materials/waste.
- 5) Submit the following for the Engineers' approval before transporting, treatment or disposal of any hazardous materials/waste:
 - a) Name, address and qualifications of the transporter,
 - b) Name, address and qualifications of the treatment facility,
 - c) Proposed treatment and/or disposal of all Hazardous Materials/Waste.
- 6) Transport all hazardous materials/waste in accordance with applicable 40 CFR 263 Standards. Provide a copy of all completed Hazardous Materials/Waste manifest/bills of lading to the Engineer within 21 days of each shipment.

h. Steel Members With Hazardous Coating:

- 1) Unless otherwise required by the Contract Documents, dispose of steel members with hazardous coating in one of the following manners:
 - a) Deliver the steel members and other hazardous waste to a licensed recycling or treatment facility capable of processing steel members with hazardous coating.
 - b) Deliver any other hazardous materials/waste to a licensed hazardous materials/waste recycling treatment facility.
- 2) Dismantle and/or cut steel members to meet the required dimensions of the recycling facility, treatment facility or other regulatory agency.
- 3) All compensation for the cost of removal and disposal of hazardous materials/waste will be included in the Cost of Removal of Existing Structures when an item for direct payment is provided in the Contract. If an item of direct payment is not provided in the Contract, the aforementioned cost is included in the cost for Clearing and Grubbing or among the other items of work in the Contract.

i. Certification of Compliance:

- 1) Furnish two copies of Certification of Compliance from the firm actually removing and disposing of the hazardous materials/waste stipulating, the hazardous materials/waste has been handled, transported and disposed of in accordance with this Specification.
- 2) The Certification of Compliance shall be attested to by a person having legal authority to bind the company.

- j. Maintain all records required by this Specification and ensure they are available to the Department upon request.

E. Method of Measurement.

Clearing and Grubbing:

- a. No Direct Payment Provided: When no item for direct payment of Clearing and Grubbing is provided by the Contract, the costs for performing all work and meeting the requirements of this Article will be included among the various scheduled items of the Contract.
- b. Direct Payment Provided: When direct payment for Clearing and Grubbing is provided in the Contract, the quantity to be paid for will be the lump sum quantity.

One or more of the following items may appear in a contract where no direct payment item for Clearing and Grubbing is provided. Only those items with an Awarded Unit Price will be considered for direct payment. All other work of Clearing and Grubbing is included among the various scheduled items of the Contract.

- c. Removal of Existing Structures: When a separate item for the Removal of Existing Structures is provided for direct payment in the Contract, the quantity to be paid for will be the lump sum quantity or actual quantities for the specific structures removed, as stipulated in the Contract Documents.

- d. **Removal of Existing Concrete Pavement:** When a separate item for Removal of Existing Concrete Pavement is provided for direct payment in the Contract, the quantity to be paid for will be the number of square yards of existing pavement of the types listed in subarticle B.5 herein, acceptably removed and disposed of, as specified. The quantity will be determined by actual measurement along the surface of the pavement before its removal. Measurements for appurtenances which have irregular surface configurations, such as curb and gutter, steps, and ditch pavement, will be the area as projected to an approximate horizontal plane. Where the removal of pavement areas is necessary only for the construction of box culverts, pipe culverts, storm sewers, french drains, inlets, manholes, etc., these areas will not be included in the measurements.
- e. **Removal of Trees:** When separate items for the Removal of Trees are provided for direct payment in the Contract, trees that are greater than 6 inches in diameter, will be paid on a per each basis by actual count by the Engineer of such trees under the appropriate item provided in the Contract. The diameter of a tree shall be obtained by measuring its circumference at 4.5 feet above the ground using a flexible tape measure and dividing the circumference by 3.14. If the tree is growing on a slope, the circumference is measured at 4.5 feet from the center of the slope. If the tree begins to branch below 4.5 feet, measure at the smallest circumference below the first branch.
- f. **Plugging Water Wells:** When a separate item for Plugging of Water Wells is provided for direct payment in the Contract, the quantity to be paid for will be the number of water wells plugged, for each type of well (artesian or non-artesian).
- g. **Mailboxes:** When a separate item is provided in the Contract for furnishing and installing mailboxes, the quantity to be paid for will be the number of mailboxes acceptably furnished and installed.
- h. **Delivery of Salvageable Material to the Department:** When a separate item is provided in the Contract for the delivery of salvageable material to the Department, the quantity to be paid for will be the Lump Sum quantity for delivery of salvageable materials to the Department as indicated in the Plans or as directed by the Engineer.

F. Basis of Payment.

Clearing and Grubbing:

- a. **No Direct Payment Provided:** When direct payment for Clearing and Grubbing is not provided in the Contract, the cost of any work of clearing and grubbing necessary for the proper construction of the Project and meeting all requirements of this Article, is included in the Contract price for the structure or other item of work for which such clearing and grubbing is required.
- b. **Direct Payment Provided:**
 - 1) Price and payment will be full compensation for all clearing and grubbing indicated or required for the construction of the entire Project, including all necessary hauling, furnishing equipment,

equipment operation, furnishing any areas required for disposal of debris, leveling of terrain and the landscaping work of trimming, etc., as specified herein, except for any areas designated to be paid for separately or to be specifically included in the costs of other work under the Contract.

- 2) Unless otherwise provided by the Contract, price and payment will be full compensation for all work required by this Article including Removal of Existing Structures, Removal of Existing Concrete Pavement, Removal of Trees, Plugging of Water Wells, Mailboxes, and Delivery of Salvageable Material to the Department.
- 3) Where construction easements are specified in the Plans and the limits of clearing and grubbing for such easements are dependent upon the final construction requirements, no adjustment will be made in the lump sum price and payment, either over or under, for variations from the limits of the easement defined on the Plans.
- c. The Contractor shall include the cost of all clearing and grubbing which might be necessary in pits or areas from which base material is obtained in the Contract price for the base in which such material is used.
- d. The clearing and grubbing of areas for obtaining stabilizing materials, where required only for the purpose of obtaining materials for stabilizing, will not be paid for separately.

Removal of Existing Structures:

- e. Price and payment will be full compensation for all work of removal and disposal of the designated structures.
- f. When direct payment for the removal of existing structures is not provided in the Contract, the cost of removing all structures is included in the Contract price for Clearing and Grubbing or, if no item of Clearing and Grubbing is included, in the compensation for the other items covering the new structure being constructed.

Removal of Existing Concrete Pavement:

- g. Price and payment will be full compensation for performing and completing all the work of removal and satisfactory disposal including any saw cutting required.
- h. When direct payment for the removal of existing concrete pavement is not provided in the Contract and no applicable item of excavation or embankment covering such work is included in the Contract, the Contractor shall include the costs of this work in the Contract price for the item of Clearing and Grubbing or, if no item of Clearing and Grubbing is included in the Contract, in any work, pipe or other structure for which the concrete pavement removal is required.

Removal of Trees:

- i. Price and payment will be full compensation for complete removal and disposal of each tree counted by the Engineer pursuant to these specifications.
- j. When direct payment for the removal of trees is not provided in the Contract, the cost of removing all trees is included in the Contract price for Clearing and Grubbing or, if no item of Clearing and Grubbing is

included in the Contract, in the compensation for all other items in the Contract.

Plugging Water Wells:

- k. Price and payment will be full compensation for each type of well acceptably plugged.
- l. When direct payment for plugging water wells is not provided in the Contract, the cost plugging water wells is included in the Contract price for Clearing and Grubbing or, if no item of Clearing and Grubbing is included in the Contract, in the compensation for all other items in the Contract.

Mailboxes:

- m. Price and payment will be full compensation for all work and materials required, including supports and numbers.
- n. When direct payment for mailboxes is not provided in the Contract, the cost for all work and materials required, including supports and numbers, is included in the Contract price for Clearing and Grubbing or, if no item of Clearing and Grubbing is included in the Contract, in the compensation for all other items in the Contract.

Delivery of Salvageable Material to the Department:

- o. Price and payment will be full compensation for all work required for delivery of the materials to the Department.
- p. When the Contract does not provide direct payment for the Delivery of Salvageable Material that is to be delivered to the County, the cost of Delivery of Salvageable Material is included in the Contract price for Clearing and Grubbing or, where no item for Clearing and Grubbing is included in the Contract, in the compensation for all other items in the Contract.

Payment Items: Payment will be made under:

No separate item(s) for Clearing and Grubbing will be provided under this contract.

120 EARTHWORK AND RELATED OPERATIONS

A. Description.

General:

- a. Earthwork and Related Operations consists of excavation for the construction of the roadway, excavation for structures and pipe, constructing backfill around structures and pipe, and constructing embankments as required for the roadway, ditches, and channel changes.
- b. Perform Earthwork and Related Operations based on the type of work specified in the Contract Documents.
- c. Meet the applicable requirements for materials, equipment and construction as specified in the Contract Documents.

B. Classes of Excavation.

Excavation of Unsuitable Material: Excavation of unsuitable material consists of the removal of muck, clay, rock or any other material that is unsuitable in its original position and that is excavated below the finished grading template. For stabilized bases and sand bituminous road mixes, the finished grading template is the top of the finished base, shoulders and slopes. For all other bases and rigid pavement, the finished grading template is the finished shoulder and slope lines and bottom of completed base or rigid pavement.

Lateral Ditch Excavation: Lateral Ditch Excavation consists of all excavation of inlet and outlet ditches to structures and roadway, changes in channels of streams, and ditches parallel to the roadway right-of-way.

Channel Excavation: Channel Excavation consists of the excavation and satisfactory disposal of all materials from the limits of the channel as shown in the Plans.

Excavation for Structures and Pipe: Excavation for Structures consists of the excavation for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

C. Excavation Requirements.

Excavation and Replacement of Unsuitable Materials: Where rock, muck, clay, or other material within the limits of the roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the Plans or indicated by the Engineer, and backfill with suitable material. Shape backfill materials to the required cross-sections. Where the removal of plastic soils below the finished earthwork grade is required, meet a construction tolerance of ± 0.2 foot in depth and ± 6 inches (each side) in width.

Lateral Ditch Excavation: Excavate inlet and outlet ditches to structures and roadway, changes in channels of streams and ditches parallel to the roadway. Dress lateral ditches to the grade and cross-section shown in the Plans.

Channel Excavation: Excavate and dispose of all materials from the limits of the channel as shown in the Plans. Excavate for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

Excavation for Structures and Pipe.

- a. General: Excavate foundation pits to permit the placing of the full widths and lengths of footings shown in the Plans, with full horizontal beds. Do not round or undercut corners or edges of footings. Perform all excavation to foundation materials, satisfactory to the Engineer, regardless of the elevation shown on the Plans. Perform all excavation in stream beds to a depth at least 4 feet below the permanent bed of the stream, unless a firm footing can be established on solid rock before such depth is reached, and excavate to such additional depth as may be necessary to eliminate any danger of undermining. Wherever rock bottom is secured, excavate in such manner as to allow the solid rock to be exposed and prepared in horizontal beds for

receiving the masonry. Remove all loose and disintegrated rock or thin strata. Have the Engineer inspect and approve all foundation excavations prior to placing masonry.

b. Earth Excavation:

- 1) Foundation Material other than the Rock: When masonry is to rest on an excavated surface other than rock, take special care to avoid disturbing the bottom of the excavation, and do not remove the final foundation material to grade until just before placing the masonry. In case the foundation material is soft or mucky, the Engineer may require excavation to a greater depth and to backfill to grade with approved material.
- 2) Foundation Piles: Where foundation piles are used, complete the excavation of each pit before driving the piles. After the driving is completed, remove all loose and displaced material, leaving a smooth, solid, and level bed to receive the masonry.
- 3) Removal of Obstructions: Remove boulders, logs, or any unforeseen obstacles encountered in excavating.

c. Rock Excavation: Clean all rock and other hard foundation material, remove all loose material, and cut all rock to a firm surface. Either level, step vertically and horizontally, or serrate the rock, as may be directed by the Engineer. Clean out all seams, and fill them with concrete or mortar.

d. Pipe Trench Excavation:

- 1) Excavate trenches for pipe culverts and storm sewers to the elevation of the bottom of the pipe and to a width sufficient to provide adequate working room. Remove soil not meeting the classification specified herein for suitable backfill material for backfilling around pipe to a depth of 4 inches below the bottom of the pipe elevation. Remove rock, boulders or other hard lumpy or unyielding material to a depth of 12 inches below the bottom of the pipe elevation. Remove muck or other soft material to a depth necessary to establish a firm foundation. Where the soils permit, ensure that the trench sides are vertical up to at least the mid-point of the pipe.
- 2) For pipe lines placed above the natural ground line, place and compact the embankment, prior to excavation of the trench, to an elevation at least 2 feet above the top of the pipe and to a width equal to four pipe diameters, and then excavate the trench to the required grade.

D. Disposal of Surplus and Unsuitable Material.

Ownership of Excavated Materials: Dispose of surplus and excavated materials as shown in the Plans or, if the Plans do not indicate the method of disposal, take ownership of the materials and dispose of them in an authorized and lawful manner.

Disposal of Muck on Side Slopes: As an exception to the provisions herein for Ownership of Excavated Materials, when approved by the Engineer, muck (A-8 material) may be placed on the slopes, or stored alongside the

roadway, provided there is a clear distance of at least 6 feet between the roadway grading limits and the muck, and the muck is dressed to present a neat appearance. In addition, this material may also be disposed of by placing it on the slopes where, in the opinion of the Engineer, this will result in an aesthetically pleasing appearance and will have no detrimental effect on the adjacent developments. Where the Engineer permits the disposal of muck or other unsuitable material inside the right-of-way limits, do not place such material in a manner which will impede the inflow or outfall of any channel or of side ditches. The Engineer will determine the limits adjacent to channels within which such materials may be disposed.

Disposal of Paving Materials: Unless otherwise noted, take ownership of paving materials, such as paving brick, asphalt block, concrete slab, sidewalk, curb and gutter, etc., excavated in the removal of existing pavements, and dispose of them outside the right-of-way. If the materials are to remain the property of the Agency, place them in neat piles as directed. Existing limerock base that is removed may be incorporated in the stabilized portion of the subgrade. If the construction sequence will allow, incorporate all existing limerock base into the project as allowed by the Contract Documents.

Disposal Areas:

- a. Where the Contract Documents require disposal of excavated materials outside the right-of-way, and the disposal area is not indicated in the Contract Documents, furnish the disposal area without additional compensation.

E. Materials for Embankment.

General Requirements for Embankment Materials:

- a. Construct embankments using suitable materials excavated from the roadway or delivered to the jobsite from authorized borrow pits.
- b. Construct the embankment using maximum particle sizes (in any dimension) as follows:
 - 1) In top 12 inches: 3 1/2 inches (in any dimension).
 - 2) 12 to 24 inches: 6 inches (in any dimension).
 - 3) In the depth below 24 inches: not to exceed 12 inches (in any dimension) or the compacted thickness of the layer being placed, whichever is less.
- c. Spread all material so that the larger particles are separated from each other to minimize voids between them during compaction. Compact around these rocks in accordance with the requirements herein for Compaction of Embankments.
- d. When and where approved by the Engineer, larger rocks (not to exceed 18 inches in any dimension) may be placed outside the one to two slope and at least 4 feet or more below the bottom of the base. Compact around these rocks to a firmness equal to that of the supporting soil. Where constructing embankments adjacent to bridge end bents or abutments, do not place rock larger than 3 1/2 inches in diameter within 3 feet of the location of any end-bent piling.

Use of Materials Excavated From the Roadway and Appurtenances: Assume responsibility for determining the suitability of excavated material for use on the project in accordance with the applicable Contract Documents. Consider the sequence of work and maintenance of traffic phasing in the determination of the availability of this material.

Authorization for Use of Borrow: Use borrow only when sufficient quantities of suitable material are not available from roadway and drainage excavation, to properly construct the embankment, subgrade, and shoulders, and to complete the backfilling of structures and pipe. Do not use borrow material until authorized by the Engineer, and then only use material from approved borrow pits.

e. Haul Routes for Borrow Pits:

- 1) Provide and maintain, at no expense to the County, all necessary roads for hauling the borrow material. Where borrow area haul roads or trails are used by others, do not cause such roads or trails to deteriorate in condition.
- 2) Arrange for the use of all non-public haul routes crossing the property of any railroad. Incur any expense for the use of such haul routes. Establish haul routes which will direct construction vehicles away from developed areas when feasible, and keep noise from hauling operations to a minimum. Advise the Engineer in writing of all proposed haul routes.

- f. Borrow Material for Shoulder Build-up: When so indicated in the Plans, furnish borrow material with a specific minimum bearing value, for building up of existing shoulders. Blend materials as necessary to achieve this specified minimum bearing value prior to placing the materials on the shoulders. Take samples of this borrow material at the pit or blended stockpile.

Materials Used at Pipes, Culverts, etc.: Construct embankments over and around pipes, culverts, and bridge foundations with selected materials.

F. Embankment Construction.

General: Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment.

Dry Fill Method:

a. General:

- 1) Construct embankments to meet the requirements of subarticle G (Compaction Requirements) and in accordance with the Acceptance Program requirements herein. Restrict the compacted thickness of the last embankment lift to 6 inches maximum.
- 2) As far as practicable, distribute traffic over the work during the construction of embankments so as to cover the maximum area of the surface of each layer.
- 3) Construct embankment in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

- a) For A-3 and A-2-4 Materials with up to 15% fines: Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 12 inches. Ensure the percentage of fines passing the No. 200 US Standard sieve in the A 2 4 material does not exceed 15%.

- b) For A-1 Plastic materials (As designated in FDOT Design Standard Index 505) and A-2-4 Materials with greater than 15% fines: Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 6 inches.

- c) Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, sumps and siphons.

- 4) When normal dewatering does not adequately remove the water, the Engineer may require the embankment material to be placed in the water or in low swampy ground in accordance with the requirements herein for Compaction Where Plastic Material Has Been Removed.

- b. Placing in Unstable Areas: Where depositing the material in water, or in low swampy ground that will not support the weight of hauling equipment, construct the embankment by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. Once sufficient material has been placed so that the hauling equipment can be supported, construct the remaining portion of the embankment in layers in accordance with the applicable provisions herein for Compaction Where Plastic Material Has Been Removed and for Compaction of Grassed Shoulder Areas.

- c. Placing on Steep Slopes: When constructing an embankment on a hillside sloping more than 20 degrees from the horizontal, before starting the fill, deeply plow or cut into steps the surface of the original ground on which the embankment is to be placed.

- d. Placing Outside Standard Minimum Slope: Where material that is unsuitable for normal embankment construction is to be used in the embankment outside the standard minimum slope (approximately one to two), place such material in layers of not more than 18 inches in thickness, measured loose. The Contractor may also place material which is suitable for normal embankment, outside such standard minimum slope, in 18 inch layers. Maintain a constant thickness for suitable material placed within and outside the standard minimum slope, unless placing in a separate operation.

Hydraulic Method:

- e. Method of Placing: When the hydraulic method is used, as far as practicable, place all dredged material in its final position in the embankment by such method. Place and compact any dredged material that is rehandled, or moved and placed in its final position by any other method, as specified herein for Compaction of

Embankments. The Contractor may use baffles or any form of construction he may select, provided the slopes of the embankments are not steeper than indicated in the Plans. Remove all timber used for temporary bulkheads or baffles from the embankment, and fill and thoroughly compact the holes thus formed. When placing fill on submerged land, construct dikes prior to beginning of dredging, and maintain the dikes throughout the dredging operation.

- f. Excess Material: Do not use excess material placed outside the prescribed slopes, below the normal high-water level, to raise the fill. Remove only the portion of this material required for dressing the slopes.
- g. Protection of Openings in Embankment: Leave openings in the embankments at the bridge sites. Remove any material which invades these openings or existing channels without additional compensation to provide the same depth of channel as existed before the construction of the embankment. Do not excavate or dredge any material within 200 feet of the toe of the proposed embankment.

G. Compaction Requirements.

Moisture Content: Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

Compaction of Embankments:

- a. Density requirements for earthwork and related operations associated with the construction of sidewalks and bike paths along with any drainage structures associated with these facilities; and for earthwork and related operations associated with the construction of turn lanes and other non-mainline traffic lanes, widening, roadway shoulders, concrete box culverts, retaining walls, and other drainage structures on the non-mainline pavement:
 - 1) Reduce the minimum required density from 100% to 95% of AASHTO T99 Method C for all earthwork items requiring densities.
- b. Density Requirements for earthwork and related operations associated with the construction of new mainline pavement, along with concrete box culverts, retaining walls, and other drainage structures on the mainline pavement:
 - 1) Except for embankments constructed by the hydraulic method as specified herein, and for the material placed outside the standard minimum slope as specified herein for Placing Outside Standard Minimum Slope, and for other areas specifically excluded herein, compact each layer of the material used in the formation of embankments to a density of at least 100% of the maximum density as required by AASHTO T 99, Method C.
 - 2) Uniformly compact each layer using equipment that will achieve the required density, and as compaction operations progress, shape and manipulate each layer as necessary to ensure uniform density throughout the embankment.

- c. Compaction Over Unstable Foundations: Where the embankment material is deposited in water or on low swampy ground, and in a layer thicker than 12 inches (as provided herein under the requirements for Placing in Unstable Areas), compact the top 6 inches (compacted thickness) of such layer to the density as specified in the Acceptance Criteria herein.
- d. Compaction Where Plastic Material Has Been Removed: Where unsuitable material is removed and the remaining surface is of the A 4, A 5, A 6, or A 7 Soil Groups, as determined by the Engineer, compact the surface of the excavated area by rolling with a sheepsfoot roller exerting a compression of at least 250 psi on the tamper feet, for the full width of the roadbed (subgrade and shoulders). Perform rolling before beginning any backfill, and continue until the roller feet do not penetrate the surface more than 1 inch. Do not perform such rolling where the remaining surface is below the normal water table and covered with water. Vary the procedure and equipment required for this operation at the discretion of the Engineer.
- e. Compaction of Material to Be Used In Base, Pavement, or Stabilized Areas: Do not compact embankment material which will be incorporated into a pavement, base course, or stabilized subgrade, to be constructed as a part of the same Contract.
- f. Compaction of Grassed Shoulder Areas: For the upper 6 inch layer of all shoulders which are to be grassed, since no specific density is required, compact only to the extent directed.
- g. Compaction of Grassed Embankment Areas: For the outer layer of all embankments where plant growth will be established, do not compact. Leave this layer in a loose condition to a minimum depth of 6 inches for the subsequent seeding or planting operations.

Compaction of Subgrade:

- h. If the Plans do not provide for stabilizing, compact the subgrade in both cuts and fills to the density specified in the Acceptance Criteria herein. For undisturbed soils, do not apply density requirements where constructing narrow widening strips or paved shoulders 5 feet or less in width.
- i. Where trenches for widening strips are not of sufficient width to permit the use of standard compaction equipment, perform compaction using vibratory rollers, trench rollers, or other type compaction equipment approved by the Engineer.
- j. Maintain the required density until the base or pavement is placed on the subgrade.

H. Backfilling Around Structures and Pipe.

Backfill Materials:

- a. Backfill to the original ground surface or subgrade surface of openings made for structures, with a sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure.
- b. Do not allow heavy construction equipment to cross over culvert or storm sewer pipes until placing and compacting backfill material to the finished earthwork

grade or to an elevation at least 4 feet above the crown of the pipe.

- c. Use of A-7 Material: In the backfilling of trenches, A 7 material may be used from a point 12 inches above the top of the pipe up to the elevation shown on the FDOT Design Standards as the elevation for undercutting of A 7 material.
- d. Time of Placing Backfill: Do not place backfill against any masonry or concrete abutment, wingwall, or culvert until the Engineer has given permission to do so, and in no case until the masonry or concrete has been in place seven days or until the specified 28 day compressive strength occurs.
- e. Placement and Compaction:
 - 1) Place the material in horizontal layers not exceeding 6 inches compacted thickness, in depth above water level, behind abutments, wingwalls and end bents or end rest piers, and around box culverts and all structures including pipe culverts. When the backfill material is deposited in water, compact per the requirements herein for Compaction Under Wet Conditions and Backfill Under Wet Conditions.
 - 2) The Contractor may elect to place material in thicker lifts of no more than 12 inches compacted thickness outside the soil envelope if he can demonstrate with a successful test section that density can be achieved. Notify the Engineer prior to beginning construction of a test section. Construct a test section of 500 feet in length. Perform five tests at random locations within the test section. All five tests must meet the density required by the Compaction of Embankments specified herein. Identify the test section with the compaction effort and soil classification in the Agency Logbook. In case of a change in compaction effort or soil classification, construct a new test section. When a test fails the Compaction Requirements specified herein, construct a new test section. The Contractor may elect to place material in 6 inches compacted thickness at any time.

Additional Requirements for Structures Other than Pipe:

- f. Density: Where the backfill material is deposited in water, obtain a 12 inch layer of comparatively dry material, thoroughly compacted by tamping, before verifying the layer and density requirements. Meet the requirements of the density Acceptance Criteria.
- g. Box Culverts: For box culverts over which pavement is to be constructed, compact around the structure to an elevation not less than 12 inches above the top of the structure, using rapid-striking mechanical tampers.
- h. Other Limited Areas: Compact in other limited areas using mechanical tampers or approved hand tampers, until the cover over the structure is at least 12 inches thick. When hand tampers are used, deposit the materials in layers not more than 4 inches thick using hand tampers suitable for this purpose with a face area of not more than 100 in². Take special precautions to prevent any wedging action against the masonry, and step or terrace the slope bounding the excavation for abutments and wingwalls if required by the Engineer.

- i. Culverts and Piers: Backfill around culverts and piers on both sides simultaneously to approximately the same elevation.
- j. Compaction Under Wet Conditions: Where wet conditions do not permit the use of mechanical tampers, compact using hand tampers. Use only A 3 material for the hand tamped portions of the backfill. When the backfill has reached an elevation and condition such as to make the use of the mechanical tampers practical, perform mechanical tamping in such manner and to such extent as to transfer the compaction force into the sections previously tamped by hand.

Additional Requirements for Pipe 15 Inches Inside Diameter or Greater:

- k. General: Trenches for pipe may have up to four zones that must be backfilled.
 - 1) Lowest Zone: The lowest zone is backfilled for deep undercuts up to within 4 inches of the bottom of the pipe.
 - 2) Bedding Zone: The zone above the Lowest Zone is the Bedding Zone. Usually it will be the backfill which is the 4 inches of soil below the bottom of the pipe. When rock or other hard material has been removed to place the pipe, the Bedding Zone will be the 12 inches of soil below the bottom of the pipe.
 - 3) Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12 inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe.
 - 4) Top Zone: The Top Zone extends from 12 inches above the top of the pipe to the base or final grade.
- l. Material:
 - 1) Lowest Zone: Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available.
 - 2) Soil Envelope: In both the Bedding Zone and the Cover Zone of the pipe, backfill with materials classified as A 1, A 2, or A 3. Material classified as A-4 may be used if the pipe is concrete pipe.
 - 3) Top Zone: Backfill the area of the trench above the soil envelope of the pipe with materials allowed on Design Standard, Index No. 505.
- m. Compaction:
 - 1) Lowest Zone: Compact the soil in the Lowest Zone to approximately match the density of the soil in which the trench was cut.
 - 2) Bedding Zone:
 - a) If the trench was not undercut below the bottom of the pipe, loosen the soil in the bottom of the trench immediately below the approximate middle third of the outside diameter of the pipe.

- b) If the trench was undercut, place the bedding material and leave it in a loose condition below the middle third of the outside diameter of the pipe. Compact the outer portions to meet the density requirements of the Acceptance Criteria. Place the material in lifts no greater than 6 inches (compacted thickness).
- 3) Cover Zone: Place the material in 6 inches layers (compacted thickness), evenly deposited on both sides of the pipe, and compact with mechanical tampers suitable for this purpose. Hand tamp material below the pipe haunch that cannot be reached by mechanical tampers. Meet the requirements of the density Acceptance Criteria.
- 4) Top Zone: Place the material in layers not to exceed 12 inches in compacted thickness. Meet the requirements of the density Acceptance Criteria.
- 5) Backfill Under Wet Conditions:
 - a) Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing.
 - b) Granular material may be used below the elevation at which mechanical tampers would be effective, but only material classified as A 3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that its moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand.

I. Acceptance Program.

Density over 105%: When a computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, perform a second density test within 5 feet. If the second density results in a value greater than 105%, investigate the compaction methods, examine the applicable Maximum Density and material description. If necessary, test an additional sample for acceptance in accordance with AASHTO T 99, Method C.

Maximum Density Determination: Determine the maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed below for Density Testing Requirements.

Density Testing Requirements: Ensure compliance, with the requirements of the Acceptance Criteria herein, by Nuclear Density testing in accordance with FDOT Florida Method FM 1 T 238. Determine the in-place moisture content for each density test. Use Florida Method FM 1 T 238, FM 5 507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of

Moisture Content of Granular Soils By Use of a Microwave Oven) for moisture determination.

Soil Classification: Perform soil classification tests in accordance with AASHTO T 88. Classify soils in accordance with AASHTO M-145 in order to determine compliance with embankment utilization requirements.

Acceptance Criteria: Obtain a minimum density in accordance with the requirements herein for Compaction of Embankments with the following exceptions:

- a. Embankment constructed by the Hydraulic Method as specified herein;
- b. Material placed outside the standard minimum slope as specified in the requirements herein for Placing Outside Standard Minimum Slope;
- c. Other areas specifically excluded herein.

Frequency: Conduct sampling and testing at a minimum frequency listed in the table below.

Test Name	Frequency
Maximum Density	One per soil type
Density	1 per 500' RDWY (Alt Lift)
Soil Classification	One per Maximum Density

J. Maintenance and Protection of Work.

While construction is in progress, maintain adequate drainage for the roadbed at all times. Maintain a shoulder at least 3 feet wide adjacent to all pavement or base construction in order to provide support for the edges.

Maintain and protect all earthwork construction throughout the life of the Contract, and take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. Repair any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work. Maintain all channels excavated as a part of the Contract work against natural shoaling or other encroachments to the lines, grades, and cross-sections shown in the Plans, until final acceptance of the Project.

K. Construction.

Construction Tolerances:

- a. Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the Plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.3 foot above or below the plan cross-section with the following exceptions:
 - 1) Shape the surface of shoulders to within 0.1 foot of the plan cross-section.
 - 2) Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
 - 3) Shape the bottom of ditches so that the ditch impounds no water.
 - 4) When the work does not include construction of base or pavement, shape the entire roadbed

(shoulder point to shoulder point) to within 0.1 foot above or below the plan cross-section.

- b. Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the Plans.

Operations Adjacent to Pavement:

- c. Carefully dress areas adjacent to pavement areas to avoid damage to such pavement.
- d. Complete grassing of shoulder areas prior to placing the final wearing course. Do not manipulate any embankment material on a pavement surface.
- e. When shoulder dressing is underway adjacent to a pavement lane being used to maintain traffic, exercise extreme care to avoid interference with the safe movement of traffic.

L. Method of Measurement.

Excavation: Excavation will be paid for by volume, in cubic yards, calculated by the method of average end areas, unless the Engineer determines that another method of calculation will provide a more accurate result. The material will be measured in its original position by field survey or by photogrammetric means as designated by the Engineer. Measurement for payment will include the excavation and disposal of unsuitable material, lateral ditch excavation, channel excavation, and excavation for structures and pipe. Payment will not be made for excavation or embankment beyond the limits shown in the Plans or authorized by the Engineer. Shrinkage or swell factors are Contractor's responsibility. When shown on the plans, factors are for informational purposes only.

Embankment:

- a. Will be paid for in cubic yards, as accepted by Engineer, calculated by the method of average end areas, unless Engineer determines that another method of calculation will provide a more accurate result. Embankment will be measured in its final position by field survey or by photogrammetric means as designated by Engineer.
- b. The measurement will include only material actually placed and compacted above the original ground line, within the lines and grades indicated in the Plans or directed by the Engineer. The length used in the computations will be the station-to-station length actually constructed. The original ground line used in the computations will be as determined prior to placing of embankment and no allowance will be made for subsidence of material below the surface of the original ground.
- c. Deduct any quantity beyond the limits shown in the Plans or authorized by Engineer. No payment will be made for additional material required to obtain compaction, material placed by Contractor outside the limits of the typical cross section, or material placed to correct for settlement of the embankment. Shrinkage or swell factors are Contractor's responsibility. When shown on the plans, factors are for informational purposes only.

M. Basis of Payment.

When No Direct Payment is Provided:

- a. When no item for Excavation or Embankment is included in the list of Contract Unit Prices, the cost of any excavation or embankment necessary for the proper construction of the Project is included in the Contract Prices for the work requiring excavation or embankment.
- b. Where the Work includes structures including pipe culvert and french drain, all earthwork costs for the installation of these items are included in their associated Contract Price.

When Direct Payment for Excavation or Embankment is Provided in the Contract:

- c. Prices and payments for the work items included in this Section will be full compensation for all work described herein, including excavating, dredging, hauling, placing, and compacting; dressing the surface of the earthwork; and maintaining and protecting the complete earthwork.
- d. Excavation:
 - 1) The total quantity of all excavation specified under this Section will be paid for at the Contract unit price for Excavation.
 - 2) No payment will be made for the excavation of any materials which are used for purposes other than those shown in the Plans or designated by the Engineer.
 - 3) No payment will be made for materials excavated outside the lines and grades given by the Engineer, unless specifically authorized by the Engineer.
- e. Embankment:
 - 1) The total quantity of embankment specified in this Section will be paid for at the Contract unit price for embankment.
 - 2) No payment will be made for materials which are used for purposes other than those shown in the Plans or designated by the Engineer.
 - 3) No payment will be made for materials placed outside the lines and grades given by the Engineer.

Payment will be made under:

No separate item(s) for Earthwork and Related Operations will be provided under this contract.

121 FLOWABLE FILL

A. Description.

When approved by the Engineer, furnish and place Flowable Fill per FDOT Design Standard Index 307, as an alternative to compacted soil, where compaction cannot be achieved through normal mechanical methods. Applications for this material include beddings, encasements, closures for tanks, pipes, general backfill for trenches, and other uses specified in the Plans.

B. Materials.

Meet the following requirements:

Fine Aggregate*	Section 902
Portland Cement (Types I, II, or III)	Section 921
Water	Section 923
Admixtures**	Section 924
Fly Ash, Slag and other Pozzolan Materials	Section 929
*Any clean fine aggregate with 100% passing a 3/8 inch mesh sieve and not more than 15% passing a No. 200 sieve may be used.	
**High air generators or foaming agents may be used in lieu of conventional air entraining admixtures and may be added at jobsite and mixed in accordance with manufacturer's recommendation.	

C. Mix Design.

Flowable Fill is a mixture of portland cement, fly ash, fine aggregate, air entraining admixture and water. Flowable fill contains a low cementitious content for reduced strength development.

Submit mix designs to the Engineer for approval. The following are suggested mix guides for excavatable and non-excavatable flowable fill:

	Excavatable	Non-Excavatable
Cement Type 1	75-100 lb/yd3	75-150 lb/yd3
Fly Ash	None	150-600 lb/yd3
Water	*	*
Air**	5-35%	5-15%
28 Day Compressive Strength**	Maximum 100 psi	Minimum 125 psi**
Unit Weight (Wet)***	90-110 lb/ft3	100-125 lb/ft3
Fine Aggregate shall be proportioned to yield 1 yd3.		
*Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.		
**Minimum 300 psi where approved by the Engineer for use above pipe culverts having less than two feet of cover measured to top of rock base.		
***The requirements for percent air, compressive strength and unit weight are for laboratory designs only and are not intended for jobsite acceptance requirements.		

D. Production and Placing.

Use flowable fill manufactured at a production facility that meets the requirements of FDOT 347-3.

Deliver flowable fill using concrete construction equipment. Revolution counter are waived. Place flowable fill by chute, pumping or other methods approved by the Engineer. Tremie flowable fill through water.

E. Construction Requirements.

Use straps, soil anchors or other approved means of restraint to ensure correct alignment when flowable fill is used as backfill for pipe or where flotation or misalignment may occur.

Place flowable fill to the designated fill line without vibration or other means of compaction. Do not place flowable fill during inclement weather, e.g. rain or ambient temperatures below 40°F. Protect flowable fill from freezing for a period of 36 hours after placement.

Take all necessary precautions to prevent any damages caused by the hydraulic pressure of the fill during placement prior to hardening. Provide the means to confine the material within the designated space.

F. Acceptance.

Acceptance of flowable fill will be based on the following documentation and a minimum temperature of flowable fill at the point of delivery of 50°F.

Furnish a delivery ticket to the Engineer for each load of flowable fill delivered to the worksite. Ensure that each ticket contains the following information:

- Project designation,
- Date,
- Time,
- Class and quantity of flowable fill,
- Actual batch proportions,
- Free moisture content of aggregates,
- Quantity of water withheld.

Leave the fill undisturbed until the material obtains sufficient strength. Sufficient strength, unless otherwise required by the Engineer, is 35 psi penetration resistance as measured using a hand held penetrometer in accordance with ASTM C-403. Provide a hand held penetrometer to measure the penetration resistance of the hardened flowable fill.

G. Method of Measurement

Flowable fill will be measured for payment in cubic yards in place, as accepted by the Engineer, when shown as a pay item in the Contract. When flowable fill is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

H. Basis of Payment.

When the item of flowable fill is included in the Contract, payment will be made at the Contract unit price per cubic yard. Such price and payment will include all cost of the

mixture, in place and accepted, determined as specified above. No measurement and payment will be made for material placed outside the neat line limits or outside the adjusted limits, or for unused or wasted material.

of all stabilizing material required and any reprocessing of stabilization areas necessary to attain the specified bearing value.

Payment will be made under:

No separate item for Flowable Fill will be provided under this contract.

160 TYPE "B" STABILIZATION (SECTION 160)

A. Page 188, Section 160 - Stabilizing:

Delete the words "bearing value" or "Limerock Bearing Ratio Method" where they occur throughout this section and substitute the words "California Bearing Ratio."

Delete all contrary references to density requirements and substitute with the following:

- a. Compaction - The density requirements for all embankment and subgrade involved in this Section shall be a minimum ninety five (95) percent for non-roadway areas and ninety eight (98) percent for roadway areas, of maximum density as determined by AASHTO T-180.

Delete all mention of Bearing Value requirements entirely and substitute with the following:

- b. California Bearing Ratio Requirements: Suitability of the soil to be compacted shall be determined by the California Bearing Ratio Test as outlined in ASTM D 1883-87. Tests shall be made on each separate course, generally before the materials have been compacted. Any areas where the materials have a C.B.R. value of less than thirty (30) at ninety five (95) percent of the maximum density as determined by AASHTO T-180 shall be stabilized (or further stabilized) as specified herein.

B. Page 189, Subarticle 160-4.1- Commercial and Local Materials – Add the following:

Except that the limerock used for stabilization shall have a minimum of at least fifty (50) percent carbonates of calcium and magnesium.

C. Page 192, Subarticle 160-7.2.1.2- Undertolerances In...; is deleted in its entirety and replaced with the following:

There shall be no undertolerances in the C.B.R. permitted.

D. Page 195, Article 160-9- Basis of Payment; Is deleted in its entirety and replaced with the following:

Payment for stabilizing including all labor and materials shall be made at the Contract Unit Price Bid as indicated in the Bid Form of the Proposal.

Such price and payments shall constitute full compensation for all work specified in this Section for Type "B" Stabilization, including furnishing, spreading and mixing

200 LIMEROCK BASE (REV. 08-23-12)

A. Description.

Construct a base composed of limerock material. Perform work in accordance with an approved Quality Control Plan meeting the requirements of Article 105 of these Specifications.

B. Materials.

Limerock base:

- a. Meet the requirements of FDOT Section 911.
- b. Produced and obtained from an FDOT approved source listed on the current FDOT Approved Aggregate Products from Mines or Terminals Listings.

More than one source of base rock on a single Contract may be used provided that a single source is used throughout the entire width and depth of a section of base. Obtain approval from Engineer before placing material from more than one source. Place material to ensure total thickness single source integrity at any station location of the base.

Intermittent placement or "Blending" of sources is not permitted.

Do not use any of the existing base that is removed to construct the new base.

Limerock is referred to hereinafter as "rock".

C. Equipment.

Use mechanical rock spreaders, equipped with a device that strikes off the rock uniformly to laying thickness, capable of producing even distribution. For crossovers, intersections and ramp areas; roadway widths of 20 feet or less; the main roadway area when forms are used and any other areas where the use of a mechanical spreader is not practicable; Contractor may spread the rock using bulldozers or blade graders.

D. Transporting Rock.

Transport the rock to its point of use, over rock previously placed if practicable, and dump it on the end of the preceding spread. Hauling and dumping on the subgrade will be permitted only when, in Engineer's opinion, these operations will not be detrimental to the subgrade.

E. Spreading Rock.

Method of Spreading:

- a. Spread the rock uniformly.
- b. Remove all segregated areas of fine or coarse rock and replace them with properly graded rock.

Number of Courses:

- c. When the specified compacted thickness of the base is greater than 6 inches, construct the base in multiple courses of equal thickness. Individual courses shall not be less than 3 inches. The thickness of the first course may be increased to bear the weight of the construction equipment without disturbing the subgrade.

Approval requirements for thicker lifts.

- d. If, through field tests, Contractor can demonstrate that the compaction equipment can achieve density for the full depth of a thicker lift, and if approved by Engineer, the base may be constructed in successive courses of not more than 8 inches compacted thickness. Engineer will base approval on results of a test section constructed using Contractor's specified compaction effort as follows:

- 1) Notify Engineer prior to beginning construction of a test section.
- 2) Construct a test section of the length of one LOT. Perform five QC density tests at random locations within the test section. At each test site, test the bottom 6 inches in addition to the entire course thickness. All QC tests and a Department Verification test must meet the density required by the Acceptance Criteria in this Article.
- 3) Identify the test section with the compaction effort and thickness in the Logbook. Remove the materials above the bottom 6 inches, at no expense to the Department. The minimum density required on the thicker lift will be the average of the five results obtained on the thick lift in the passing test section.
- 4) Maintain the exposed surface as close to "undisturbed" as possible; no further compaction will be permitted during the test preparation. If unable to achieve the required density, remove and replace or repair the test section to comply with the specifications at no additional expense to the Department. Contractor may elect to place material in 6 inches compacted thickness at any time.
- 5) Once approved, a change in the source of base material will require the construction of a new test section. Do not change the compaction effort once the test section is approved. Engineer will periodically verify the density of the bottom 6 inches during thick lift operations.
- 6) Engineer may terminate the use of thick lift construction and instruct Contractor to revert to the 6 inches maximum lift thickness if Contractor fails to achieve satisfactory results or meet applicable specifications.

Rock Base for Shoulder Pavement: Unless otherwise permitted, complete all rock base shoulder construction at any particular location before placing the final course of pavement on the traveled roadway. When dumping material for the construction of a rock base on the shoulders, do not allow material capable of scarring or contaminating the pavement surface on the adjacent pavement. Immediately sweep off any rock material that is deposited on the surface course.

F. Compacting and Finishing Base.

General:

- a. Perform work in accordance with an approved Quality Control Plan meeting the requirements of Article 105 of these Specifications and the Acceptance Criteria herein below.
- b. Construct mainline pavement lanes, turn lanes, ramps, parking lots, concrete box culverts and retaining wall systems in sections of not less than 300 feet in length or for the full length of the rock base. For these, a LOT is defined as a single lift of finished embankment not to exceed 500 feet.
- c. Construct shoulder-only areas, bike/shared use paths, and sidewalks in sections of not less than 300 feet in length or for the full length of the rock base. For these, a LOT is defined as 1,000 feet or one Day's Production, whichever is greater. Shoulders compacted separately shall be considered separate LOTs.

Single Course Base: After spreading, scarify the entire surface. Shape the base to produce the required grade and cross-section, free of scabs and laminations, after compaction.

Multiple Course Base: Clean the first course of foreign material, then blade and bring it to a surface cross-section approximately parallel to the finished base. Before spreading any material for the upper courses, allow Engineer to make density tests for the lower courses to determine that the required compaction has been obtained. After spreading the material for the top course, scarify finish and shape its surface to produce the required grade and cross-section, free of scabs and laminations, after compaction.

Moisture Content: When the material does not have the proper moisture content to ensure the required density, wet or dry it as required. When adding water, uniformly mix it in to the full depth of the course that is being compacted. During wetting or drying operations, manipulate, as a unit, the entire width and depth of the course that is being compacted.

Thickness Requirements: Within the entire limits of the length and width of the finished base, meet the specified plan thickness in accordance with the Quality Control requirements specified in Depth and Surface Testing Requirements subarticle herein below.

Correction of Defects:

- d. Contamination of Base Material: If, at any time, the subgrade material becomes mixed with the base course material, dig out and remove the mixture, and reshape and compact the subgrade. Then replace the materials removed with clean base material, and shape and compact as specified above. Perform this work at no expense to the Department.
- e. Cracks and Checks: If cracks or checks appear in the base, either before or after priming, which, in the opinion of Engineer, would impair the structural efficiency of the base, remove the cracks or checks by rescarifying, reshaping, adding base material where necessary, and recompacting.

Compaction of Widening Strips:

- f. Where base construction consists of widening strips and the trench width is not sufficient to permit use of standard base compaction equipment, compact the base using vibratory compactors, trench rollers or other special equipment which will achieve the density requirements specified herein.
- g. When multiple course base construction is required, compact each course prior to spreading material for the overlaying course.

G. Acceptance Criteria:

Density: Within the entire limits of the width and depth of the base, obtain a minimum density in any LOT of 98% of modified Proctor maximum density as determined by FM 1-T 180, Method D. For shoulder only areas and bike/shared use paths, obtain a minimum density of 95% of the modified Proctor maximum density as determined by FM 1-T 180, Method D.

Frequency: Conduct QC sampling and testing at a minimum frequency listed in the table below. Engineer will perform Verification sampling and tests at a minimum frequency listed in the tables below.

Mainline Pavement Lanes, Turn Lanes, Ramps, Parking Lots, Concrete Box Culverts and Retaining Wall Systems		
Test Name	Quality Control	Verification
Modified Proctor Maximum Density	One per eight consecutive LOTs	One per 16 consecutive LOTs
Density	One per LOT	One per four LOTs
Roadway Surface	Ten per LOT	Witness
Roadway Thickness	Three per LOT	Witness

Shoulder-Only, Bike/Shared Use Path and Sidewalk Construction		
Test Name	Quality Control	Verification
Modified Proctor Maximum Density	One per two LOTs	One per four LOTs
Density	One per LOT	One per two LOTs
Surface	Five per 500 feet	Witness
Thickness	Three per 600 consecutive feet	Witness

Initial Equipment Comparison:

- a. Before initial production, perform a comparison test using the Quality Control, Verifications and Independent Assurance gauges. Unless Engineer instructs, do not perform the initial equipment comparison more than once per project. When comparing the computed dry density of one nuclear gauge to a second gauge, ensure that the difference between the two computed dry densities does not

exceed 2 lb/ft³ between gauges from the same manufacturer, and 3 lb/ft³ between gauges from different manufacturers. Repair or replace any Quality Control gauge that does not compare favorably with the Independent Assurance gauge.

- b. Perform a comparison analysis between the Quality Control nuclear gauge and the Verification nuclear gauge any time a nuclear gauge or repaired nuclear gauge is first brought to the project. Repair and replace any Quality Control gauge that does not compare favorably with the Verification gauge at any time during the remainder of the project. Calibrate all Quality Control gauges annually.

Initial Production Lot:

- c. Before construction of any other LOT, prepare a 500-foot initial control section consisting of one full LOT in accordance with the approved Quality Control Plan for the Project.
- d. Notify Engineer at least 24 hours prior to production of the initial control section. Perform all QC tests required herein below. When the initial Quality Control test results pass specifications, Engineer will perform a Verification test to verify compliance with the specifications.
- e. Do not begin constructing another LOT until successfully completing the initial production LOT. Engineer will notify Contractor of the initial production lot approval within three working days after receiving Contractor's Quality Control data when test results meet the following conditions:
 - 1) Quality Control tests must meet the specifications.
 - 2) Verification test must meet the specifications.
 - 3) Difference between Quality Control and Verification computed Dry Density results shall meet the requirements provided above for Initial Equipment Comparison.
 - 4) If Verification test result fails the density requirements of the Acceptance Criteria, correct the areas of non-compliance. The Quality Control and Verification tests will then be repeated. Engineer will reject Contractor's Quality Control Plan after three unsuccessful Verification attempts. Submit a revised Quality Control Plan to Engineer for approval.

Density over 105%:

- f. When a QC computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, Engineer will perform an Independent Verification density test within 5 feet.
- g. If the Independent Verification density results in a value greater than 105%, Engineer will investigate the compaction methods, examine the applicable Standard Proctor Maximum Density and material description.
- h. Engineer may collect and test an Independent Verification Standard Proctor Maximum Density sample for acceptance in accordance with the Acceptance Criteria.

Quality Control Tests:

- i. Standard Proctor Maximum Density Determination: Determine the Quality Control standard Proctor maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in the Acceptance Criteria.
- j. Density Testing Requirements: Ensure compliance to the requirements of the Acceptance Criteria by Nuclear Density testing in accordance with FM 1-T 238. Determine the in-place moisture content for each density test. Use Florida Method FM 1-T 238, FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D-4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven) for moisture determination.
- k. Soil Classification: Perform soil classification tests on the sample collected for the Standard Proctor Maximum Density Determination above, in accordance with AASHTO T-88. Classify soils in accordance with AASHTO M-145 in order to determine compliance with embankment utilization requirements. Unless required by Engineer, do not test or classify materials for stabilized subgrade or base.

Department Verification:

- l. Engineer will conduct a Verification test(s) in order to accept all materials and work associated with the Quality Control Tests. Engineer will verify the Quality Control results if they meet the Verification Comparison Criteria, otherwise Engineer will implement Resolution procedures.
- m. Engineer will select test locations, including Station, Offset, and Lift, using a Random Number generator based on the Lots under consideration. Each Verification test evaluates all work represented by the Quality Control testing completed in those LOTs.
- n. In addition to the Verification testing, Engineer may perform additional Independent Verification (IV) testing. Engineer will evaluate and act upon the IV test results in the same manner as Verification test results.
- o. When the project requires less than four Quality Control tests per material type, Engineer reserves the right to accept the materials and work through visual inspection.

Reduced Testing Frequency: When no Resolution testing is required for 12 consecutive verified LOTs, or if required, the QC test data was upheld, reduce the QC density testing to one test every two LOTs by identifying the substantiating tests in the Density Log Book and notifying Engineer in writing prior to starting reduced frequency of testing. Generate random numbers based on the two LOTs under consideration. When Quality Control test frequency is reduced to one every two LOTs, obtain Engineer's approval to place more than one LOT over an untested LOT. Assure similar compaction efforts for the untested LOTs. If the Verification test fails, and Quality Control test data is not upheld by Resolution testing, the Quality Control testing will revert to the original frequency of one Quality Control test per LOT. Do not apply reduced testing frequency in construction of shoulder-only areas, bike/shared use paths and sidewalks.

Quality Control Testing:

- p. Modified Proctor Maximum Density Requirement: Collect enough material to split and create three separate samples and retain two for Engineer's Verification and Resolution testing until Engineer accepts the 16 LOTs represented by the samples.
- q. Depth and Surface Testing Requirements:
 - 1) Notify Engineer a minimum of 24 hours before checking base depths and surface checking. Determine test locations including Stations and Offsets, using the Random Number generator approved by the Department. Do not perform depth and surface checks until Engineer is present to witness. Perform thickness check on the finished base or granular subbase component of a composite base. Provide traffic control, coring/boring equipment, and an operator for the coring/boring equipment. Traffic control is to be provided in accordance with the standard maintenance of traffic requirements of the Contract.
 - 2) The thickness is considered deficient, if the measured depth is over 1/2 inch less than the specified thickness. Correct all deficient areas of the completed base by scarifying and adding additional base material. As an exception, if authorized by the Department, such areas may be left in place without correction and with no payment.
 - 3) Check the finished surface of the base course with a template cut to the required crown and with a 15 foot straightedge laid parallel to the centerline of the road. Correct all irregularities greater than 1/4 inch to the satisfaction of the Engineer by scarifying and removing or adding rock as required, and recompact the entire area as specified hereinbefore.
- r. Surface & Thickness Reduced Testing Frequency: When no Resolution testing is required for 12 consecutive verified LOTs, or if required, the QC test data was upheld, reduce the QC surface and/or thickness checks to one half the minimum requirements as stated in the frequency requirements above (e.g. Reduce frequency from ten per LOT to ten per two LOTs) by identifying the substantiating tests and notifying Engineer in writing prior to starting reduced frequency of testing. If the Verification test fails, and Quality Control test data is not upheld by Resolution testing the Quality Control testing will revert to the original frequency required by the Acceptance Criteria above. The results of the Independent Verification testing will not affect the frequency of the Quality Control testing.

Department Verification Tests:

- s. Maximum Density: Engineer will randomly select one of the remaining two split samples and test in accordance with FM 1-T 180, Method D.
- t. Thickness and Surface Testing Requirements: The Department will witness the base depth and surface checks to ensure compliance with the Depth and Surface Testing Requirements above. If the QC test results are not deficient as defined therein, the LOT or 500-foot section will be accepted. If the QC test results

are deficient, resolve deficiencies in accordance with the Depth and Surface Testing Requirements. Repeat acceptance testing. Provide traffic control, coring/boring equipment, and an operator for the coring/boring equipment.

u. Verification Comparison Criteria and Resolution Procedures:

- 1) Modified Proctor Maximum Density: Engineer will compare the Verification test results for Maximum Density to the corresponding Quality Control test results. If the test result is within 4.5 lb/ft³ of the QC test result, the LOTs will be verified. Otherwise, Engineer will collect the Resolution split sample corresponding to the Verification sample tested. The State Materials Office or an AASHTO accredited laboratory designated by the State Materials Office will perform Resolution testing. The material will be sampled and tested in accordance with FM 1-T 180, Method D.
- 2) Engineer will compare the Resolution Test results with the Quality Control test results. If the Resolution Test result is within 4.5 lb/ft³ of the corresponding Quality Control test result, Engineer will use the Quality Control test results for material acceptance purposes for each corresponding set of LOTs. If the Resolution test result is not within 4.5 lb/ft³ of the corresponding Quality Control test, Engineer will collect the remaining Verification split sample for testing. Verification Test results will be used for material acceptance purposes for the LOTs in question.
- 3) Density: When a Verification or Independent Verification density test does not meet the requirements of the Acceptance Criteria, retest at a site within a 5 feet radius of the Verification test location and observe the following:
 - a) If the Quality Control retest meets the Acceptance Criteria and compares favorably with the Verification or Independent Verification test, Engineer will accept the LOTs in question.
 - b) If the Quality Control retest does not meet the Acceptance Criteria and compares favorably with the Verification or Independent Verification test, rework and retest the material in that LOT. Engineer will re-verify the LOTs in question.
 - c) If the Quality Control retest and the Verification or Independent Verification test do not compare favorably, complete a new Equipment-Comparison Analysis. Once acceptable comparison is achieved, retest the LOTs. Engineer will perform new verification testing. Acceptance testing will not begin on a new LOT until Contractor has a gauge that meets the comparison requirements.
- 4) Thickness and Surface Testing Requirements: Resolve deficiencies in accordance with the Depth and Surface Testing Requirements above.

H. Priming and Maintaining.

Priming: Apply the prime coat only when the base meets the specified density requirements and when the moisture content in the top half of the base does not exceed the optimum moisture of the base material. At the time of priming, ensure that the base is firm, unyielding and in such condition that no undue distortion will occur.

Maintaining: Maintain the true crown and template, with no rutting or other distortion, while applying the surface course.

I. Thickness of Base.

Engineer will determine, as follows, the average thickness of the compacted limerock base for use in the measurements specified in the Method of Measurement:

- a. Average thickness will be calculated per typical cross-section for the entire job as a unit.
- b. Any measured thickness that is more than 1/2 inch greater than the design thickness shown on the typical cross-section in the Plans or, when no plans exist, the thickness specified in the description of the Contract pay item, will be considered as the design or specified thickness plus 1/2 inch.
- c. Any areas of existing base left in place will not be included in the calculations.

J. Method of Measurement.

The quantity to be paid for will be the pay area in square yards of limerock base constructed pursuant to these specifications that is measured, adjusted as specified below, and accepted by Engineer.

- a. Normal Thickness Base: The surface area of specified normal thickness base to be adjusted will be the measured quantity as specified above, omitting any areas not accepted for payment under Subarticle 200-J.2 below, and omitting areas which are to be included for payment under the Method of Measurement for Variable Thickness Base Authorized by Engineer. The pay area is determined by adjusting the aforementioned surface area using the formula below limited to a maximum for the final pay area of 105 percent of the surface area.

1)
$$\text{Pay Area} = \text{Surface Area} \times ((\text{Calculated Average Thickness per these Specifications}) / (\text{Plan or Specified Thickness}))$$

- b. Variable Thickness Base Authorized by Engineer: Where the base is constructed to an authorized compacted thickness other than the normal thickness as shown on the typical section in the Plans, as specified on the Plans, the thickness specified in the description of the Contract pay item, or ordered as by Engineer for providing additional depths at culverts or bridges, or for providing transitions to connecting pavements; the volume of such authorized variable thickness compacted base will be calculated from authorized lines and grades, or by other methods selected by Engineer, and converted to equivalent square yards of normal thickness base for payment.

Additional areas that will not be included in the above measurements for payment include:

- c. Areas of existing base left in place;
- d. Areas where under-thickness is in excess of the allowable tolerance as specified in Subarticle 200-G.9; and
- e. Areas where the work under other Contract pay item(s) includes the construction or restoration of a limerock base.

K. Basis of Payment.

Price and payment will be full compensation for all the work specified in this Article, including correcting all defective surface and deficient thickness, removing cracks and checks as provided above in Crack and Checks, prime coat application meeting the requirements of FDOT Section 300, and the additional rock required for crack elimination.

**DIVISION 300 BITUMINOUS TREATMENTS SURFACE
COURSES AND CONCRETE PAVEMENT**

**327 MILLING OF EXISTING ASPHALT PAVEMENT (REV.
05-14-12)**

A. Description.

At the locations and to the average depth of cut specified by the Contract Documents or Work Order, remove existing asphalt concrete pavement by milling to improve the rideability and cross slope of the finished pavement, to lower the finished grade adjacent to existing curb prior to resurfacing, or to completely remove existing pavement.

Take ownership of milled material.

B. Equipment.

Provide a milling machine capable of maintaining a depth of cut and cross slope that will achieve the results specified in the Contract Documents or Engineer. Use a machine with a minimum overall length (out to out measurement excluding the conveyor) of 18 feet and a minimum cutting width of 6 feet.

Equip the milling machine with a built-in automatic grade control system that can control the transverse slope and the longitudinal profile to produce the specified results.

To start the project, Engineer will approve any commercially manufactured milling machine that meets the above requirements. If it becomes evident after starting milling that the milling machine cannot consistently produce the specified results, Engineer will reject the milling machine for further use.

Contractor may use a smaller milling machine when milling to lower the grade adjacent to existing curb or other areas where it is impractical to use the above described equipment.

Equip the milling machine with means to effectively limit the amount of dust escaping during the removal operation.

For complete pavement removal, Engineer may approve the use of alternate removal and crushing equipment in lieu of the equipment specified above.

C. Construction.

General:

- a. Remove the existing raised reflective pavement markers prior to milling. Include the cost of removing existing pavement markers in the price for milling.
- b. When milling to improve rideability or cross slope, remove the existing pavement to the average depth specified by the Contract Documents or Work Order, in a manner that will restore the pavement surface to a uniform cross-section and longitudinal profile. Engineer may require the use of a stringline to ensure maintaining the proper alignment.
- c. Establish the longitudinal profile of the milled surface in accordance with the milling plans. Ensure that the final

cross slope of the milled surface parallels the surface cross slope shown on the Plans or as directed by Engineer. Establish the cross slope of the milled surface by a second sensing device near the outside edge of the cut or by an automatic cross slope control mechanism. The Plans may waive the requirement of automatic grade or cross slope controls where the situation warrants such action.

- d. Operate the milling machine to minimize the amount of dust being emitted. Engineer may require prewetting of the pavement.
- e. Provide positive drainage of the milled surface and the adjacent pavement. Perform this operation on the same day as milling. Repave all milled surfaces no later than the day after the surface was milled unless otherwise stated in the plans.
- f. If traffic is to be maintained on the milled surface prior to the placement of the new asphalt concrete, provide suitable transitions between areas of varying thickness to create a smooth longitudinal riding surface. Produce a pattern of striations that will provide an acceptable riding surface. Engineer will require the control the traveling speed of the milling machine to produce a texture that will provide an acceptable riding surface.
- g. Prior to opening an area which has been milled to traffic, sweep the pavement with a power broom or other approved equipment to remove, to the greatest extent practicable, fine material which will create dust under traffic. Sweep in a manner that will minimize the potential for creation of a traffic hazard and to minimize air pollution.
- h. Sweep the milled surface with a power broom prior to placing asphalt concrete.
- i. In urban and other sensitive areas, use a street sweeper or other equipment capable of removing excess milled materials and controlling dust. Obtain Engineer's approval of such equipment, contingent upon its demonstrated ability to do the work.
- j. Perform the sweeping operation immediately after the milling operations or as directed by Engineer.

Quality Control Requirements:

- k. Furnish an electronic level with a length of 4 feet and an accuracy of plus or minus 0.1 degree approved by Engineer for the control of cross slope. Make this electronic level available at the jobsite at all times during milling operations. Calibrate and compare electronic levels at a minimum frequency of once per day before any milling operation, and at any time as directed by Engineer. If the comparison between the QC and Verification levels is within the comparison tolerance of plus or minus 0.2%, the QC level is considered to compare favorably and can be used for measurement and acceptance of cross slopes. If the levels do not compare favorably, perform a second comparison using another calibrated electronic level (PWWM or Contractor) for resolution. If this resolution level compares favorably with the QC level, the QC level is considered to be verified. If the second level does not compare favorably with the QC level, discontinue the use of the QC electronic level and obtain another approved electronic level that meets the requirements of this specification. Regardless of the

comparison analysis outcome, Contractor assumes all risk associated with placing the pavement at the correct cross slope.

- I. Multiple cuts may be made to achieve the required pavement configuration or depth of cut. Measure the cross slope of the milled surface by placing the level at the center location of a lane and perpendicular to the roadway centerline. Record all the measurements to the nearest 0.1% on an approved form and submit to Engineer for documentation.
 - 1) Tangent Sections: Measure the cross slope per lane at a minimum frequency of one measurement every 100 feet. Calculate the absolute deviation of cross slope at each measurement and then average the absolute deviation of ten consecutive cross slope measurements. The absolute deviation is the positive value of a deviation. When the average absolute deviation cross slope is consistently within the acceptance tolerance as shown in Table 327-1 and upon approval by Engineer, the frequency of the cross slope measurements can be reduced to one measurement every 200 feet during milling operations.
 - 2) Superelevated Sections: Measure the cross slope every 100 feet per lane within the length of full superelevation. Calculate the absolute deviation of each measurement and then average the absolute deviation of ten consecutive cross slope measurements. For every transition section, measure the cross slope at control points identified in the plans or, if not shown in the plans, at a control point at a location of 0.0% cross slope. For curves where the length of the fully superelevated section is less than 250 feet, measure the cross slope at the beginning point, midpoint and ending point of the fully superelevated section, calculate the absolute deviation and average. When the number of measurements is less than ten and the length of full superelevation is greater than 250 feet, average the absolute deviation of all measurements.
- m. If the average absolute deviation of the cross slope measurements falls outside the acceptance tolerance shown in Table 327-1, stop the milling operations and make adjustments until the problem is resolved to the satisfaction of Engineer. If an individual cross slope deviation falls outside the acceptance tolerance as shown in Table 327-1, make corrections only in the deficient area to the satisfaction of Engineer at no cost to the Department. For pavement with multiple cuts, the deficient areas not caused by the final cut may be left in place upon approval of Engineer. All milling corrections shall be completed before placement of the asphalt course unless stated otherwise in the plans or as determined by Engineer.
- n. The limits of deficient areas requiring correction may be verified and adjusted with more accurate measurement methods, including survey instruments, upon approval by Engineer at no cost to the Department. Should Contractor wish to have any corrections waived, submit a request to Engineer for approval. Engineer may waive the corrections at no reduction in payment if an engineering determination indicates that the

deficiencies are sufficiently separated so as not to significantly affect the final cross slope or project grade.

- o. For intersections, tapers, crossovers, transitions at the beginning and end of the project, bridge approaches and similar areas, adjust the cross slope to match the actual site conditions, or as directed by Engineer.

TABLE 327-1 Cross Slope Milling Acceptance Tolerance		
Roadway Feature	Individual Absolute Deviation	Average Absolute Deviation
Tangent section (including turn lanes)	0.4%	0.2%
Superelevated curve	0.4%	0.2%
Shoulder	0.5%	0.5%

D. Milled Surface.

Provide a milled surface with a reasonably uniform texture, within 1/4 inch of a true profile grade, and with no deviation in excess of 1/4 inch from a straightedge applied to the pavement perpendicular to the centerline. Ensure that the variation of the longitudinal joint between multiple cut areas does not exceed 1/4 inch. Engineer may accept areas varying from a true surface in excess of the above stated tolerance without correction if Engineer determines that they were caused by a pre-existing condition which could not have reasonably been corrected by the milling operations. Correct any unsuitable texture or profile, as determined by Engineer, at no additional expense to the Department.

Engineer may require remilling of any area where a surface lamination causes a non-uniform texture to occur.

E. Method of Measurement.

The quantity to be paid for will be the area, in square yards, over which milling is completed and accepted by Engineer.

F. Basis of Payment.

Price and payment will be full compensation for all work specified in this Article, including hauling off and stockpiling or otherwise disposing of the milled material.

Payment will be made under:

- a. No separate pay item(s) for Milling of Existing Asphalt Pavement will be provided under this contract.

334 HOT MIX ASPHALT (REV. 01-29-15)

A. Description.

General.

- a. Construct plant mixed Hot Mix Asphalt (HMA) pavements based on the type of mixture specified in the Contract Documents and for the Asphalt Work Categories defined below.
- b. Meet all applicable requirements for plants, material, equipment, and construction specified herein.

Asphalt Work Categories.

- c. Asphalt Work Category 1: Includes the construction of shared use paths and miscellaneous asphalt.
- d. Asphalt Work Category 2: Includes the construction of new asphalt turn lanes, paved shoulders and other non-mainline pavement locations.
- e. Asphalt Work Category 3: Includes the construction of new mainline asphalt pavement I, milling and resurfacing.

Mix Types.

- f. Use a HMA mix that meets the requirements of this specification.
- g. In the event a mix type is not identified in the Contract Documents use, subject to Engineer's approval, the appropriate HMA mix from Table 1 below.
- h. Mixtures are based on the design traffic level of the project, expressed in 18,000 pounds Equivalent Single Axle Loads (ESAL's).
- i. A Type SP or FC mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no additional cost.

Table 1 HMA Fine Mix Types		
Asphalt Work Category	Mix Types	Traffic Level ⁽²⁾
1	Type SP-9.5 ⁽¹⁾	A
2	Structural Mixes: Types SP-9.5 or SP-12.5 ⁽¹⁾ Friction Mixes: Types FC-9.5 or FC-12.5 ⁽¹⁾	B or C
3	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	C
⁽¹⁾ Equivalent mixes may be approved as determined by the Engineer.		
⁽²⁾ Traffic Level (1x10 ⁶ ESAL's): A is <0.3; B is 0.3 to <3; and C is 3 to <10		

Gradation Classification.

- j. Use only fine HMA mixes meeting the requirements of subarticle C.2.b below. The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:
 - 1) Type SP-9.5, FC-9.5 9.5 mm (3/8")

- 2) Type SP-12.5, FC-12.5 12.5 mm (1/2")

Total Pavement Thickness.

- k. The total pavement thickness of the HMA Pavement will be based on a specified spread rate or plan thickness as shown in the Contract Documents. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness.
- l. When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:
 - 1) Spread rate (lbs/yd²) = t x G_{mm} x 43.3 where:
 - a) t = Thickness (in.) (Plan thickness or individual layer thickness)
 - b) G_{mm} = Maximum specific gravity from the mix design
 - c) For target purposes only, spread rate calculations shall be rounded to the nearest whole number.
- m. Plan quantities are based on a G_{mm} of 2.540, corresponding to a spread rate of 110 lbs. per square yard per inch. Pay quantities will be based on the actual maximum specific gravity of the mix being used.

Layer Thicknesses.

- n. Structural Course Layer(s):
 - 1) Unless otherwise called for in the Contract Documents, the allowable layer thicknesses for fine Type SP HMA mixes are as follows:
 - a) Type SP-9.5.....1 - 1 1/2 inches
 - b) Type SP-12.5.....1 1/2 - 2 1/2 inches
 - 2) Fine Type SP-9.5 mixes are limited to the top two structural layers, two layers maximum.
- o. Friction Course Layer (FC-12.5 and FC-9.5):
 - 1) The thickness of the friction course layer will be the plan thickness as shown in the Contract Document or as directed in writing by the Engineer. For construction purposes, the plan thickness will be converted to spread rate as defined in Subarticle A.5 above.

Additional Requirements.

- p. Type SP HMA fine mixtures:
 - 1) When construction includes the paving of adjacent shoulders (≤5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Contract Documents.
 - 2) For overbuild layers, use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness

may be increased by 1/2 inch, unless called for differently in the Contract Documents.

Weight of Mixture.

- q. The weight of the mixture shall be determined as provided in FDOT 320-2.2 (Electronic Weigh Systems).

B. Materials.

General Requirements: Meet the material requirements specified in FDOT Division III (Materials). Specific references as follows:

Superpave PG Asphalt Binder	FDOT 916-1
Recycling Agents	FDOT 916-2
Course Aggregate	FDOT Section 901
Fine Aggregate	FDOT Section 902

Asphalt Binder:

- a. For Type SP Mixtures:
 - 1) Unless specified elsewhere in the Contract Documents, use a PG 67-22 asphalt binder from the FDOT's Approved Products List (APL).
 - 2) Meet the requirements of FDOT Section 916 and Subarticle B.4 below.
- b. For Type FC Mixtures:
 - 1) Use an ARB-5 asphalt rubber binder meeting the requirements of FDOT Section 336 and any additional requirements or modifications specified herein for the various mixtures.
 - 2) If called for in the Contract Documents, use a PG 76-22 asphalt binder meeting the requirements of FDOT 916-1.
 - 3) For projects with a total quantity of FC-9.5 or FC-12.5 less than 500 tons, the Contractor may elect to substitute for the ARB-5, a PG 76-22 Asphalt Binder that meets the requirements of FDOT 916-1.

Aggregate:

- c. Provide certification from the aggregate supplier that the material meets all requirements for construction aggregates stipulated in the Contract Documents.
- d. Aggregates and sources used must be identified in the FDOT "Approved Aggregate Products from Mines or Terminals" current listings.
- e. For Type FC mixes:
 - 1) Use an aggregate blend that consists of crushed granite, crushed Oolitic limestone, other crushed materials (as approved by FDOT for friction courses per Rule 14-103.005, Florida Administrative Code), or a combination of the above. Crushed limestone from the Oolitic formation may be used if it contains a minimum of 12% silica material as determined by FDOT Test Method FM 5-510 and FDOT grants approval of the source prior to its use. As an exception, mixes that contain a minimum of 60% crushed granite may either contain:

- a) Up to 40% fine aggregate from other sources, or
- b) A combination of up to 15% Reclaimed Asphalt Pavement (RAP) Material and the remaining fine aggregate from other sources.
- c) A list of aggregates approved for use in friction courses may be available on the FDOT's website. The URL for obtaining this information, if available, is: <https://mac.fdot.gov/smreports>

Reclaimed Asphalt Pavement (RAP) use in Type SP asphalt mixture:

- f. General requirements: RAP may be used as a component of the Type SP asphalt mixture, if approved by the Engineer. Usage of RAP is subject to the following requirements:
 - 1) Limit the amount of RAP material used in the mix to a maximum of 50 percent by weight of total aggregate.
 - 2) When using a PG 76-22 Asphalt Binder, limit the amount of RAP material used in the mix to a maximum of 20 percent by weight of total aggregate.
 - 3) Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.
 - 4) Provide RAP material having a minimum average asphalt content of 4.0 percent by weight of total mix. The Engineer may sample the stockpile to verify that this requirement is met.
 - 5) Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycle mixture. If oversized RAP material appears in the completed recycle mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not immediately taken, stop plant operations.
- g. Material Characterization: Assume responsibility for establishing the asphalt binder content, gradation, viscosity and bulk specific gravity (Gsb) of the RAP material based on a representative sampling of the material.
- h. Asphalt Binder for Mixes with RAP:
 - 1) Select the appropriate asphalt binder grade based on Table 2 below.
 - 2) The Engineer reserves the right to change the asphalt binder type and grade at design based on the characteristics of the RAP asphalt binder, and reserves the right to make changes during production.
 - 3) Maintain the viscosity of the recycled mixture within the range of 5,000 to 15,000 poises.

Table 2 Asphalt Binder Grade for Mixes Containing RAP	
Percent RAP	Asphalt Binder Grade
<20	PG 67-22

20 – 29	PG 64-22
≥ 30	Recycling Agent

C. Composition of Mixture.

General: Compose the asphalt mixture using a combination of aggregates, mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

Mix Design:

- a. General: Design the asphalt mixture in accordance with AASHTO R35 04, except as noted herein. Submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. Prior to the production of any asphalt mixture, obtain the Engineer's conditional approval of the mix design. If required by the Engineer, send representative samples of all component materials, including asphalt binder to a laboratory designated by the Engineer for verification. The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and at his discretion, the Engineer may no longer allow the use of the mix design.
- b. Mixture Gradation Requirements: Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M323 04, Table 3. Aggregates from various sources may be combined.
 - 1) Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323 04, Table 3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323 04, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point. Use only fine mixes.
- c. Gyratory Compaction: Compact the design mixture in accordance with AASHTO T312 04. Use the number of gyrations as defined in AASHTO R35 04, Table 1.
- d. Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323 04, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323 04, Table 6.
- e. Moisture Susceptibility:
 - 1) Test 4 inch specimens in accordance with FM 1 T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 psi. If necessary, add a liquid anti-stripping agent from the FDOT's Qualified Products List, or hydrated lime in order to meet these criteria.

- 2) In lieu of moisture susceptibility testing, add a liquid anti-stripping agent from the FDOT's Qualified Products List. Add 0.5% liquid anti-stripping agent by weight of binder.

- f. Additional Information: In addition to the requirements listed above, provide the following information on each mix design:

- 1) The design traffic level and the design number of gyrations (N_{design}).
- 2) The source and description of the materials to be used.
- 3) The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source.
- 4) The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
- 5) A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
- 6) The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component.
- 7) A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1 percent.
- 8) A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature. Do not exceed a target temperature of 330°F for modified asphalts and 315°F for unmodified asphalts.
- 9) Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.
- 10) The name of the Mix Designer.
- 11) The ignition oven calibration factor.

D. Contractor Quality Control.

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and Project site for quality control purposes.

Acceptance of any automatic delivery ticket printout, electronic weight delivery ticket, or other evidence of weight of the materials or approval of any particular type of materials or production methods will not constitute agreement by the County that such matters are in accordance with the Contract Documents and it shall be the Contractor's responsibility to ensure that the

materials delivered to the project are in accordance with the Contract Documents.

E. General Construction Requirements.

Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the laying operations.

Limitations of Laying Operations:

- a. **General:** Spread the mixture only when the surface upon which it is to be placed has been previously prepared, is intact, firm, and properly cured, and is dry.
- b. **Air Temperature:** Spread the mixture only when the air temperature in the shade and away from artificial heat is at least 40°F for layers greater than 1 inch (100 lb/yd²) in thickness and at least 45°F for layers 1 inch (100 lb/yd²) or less in thickness (this includes leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd² or less is 50°F.

Mix Temperature: Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the roadway, within a range of ±30°F from the target temperature as shown on the mix design. Reject all loads outside of this range.

Transportation of the Mixture: Transport the mixture in vehicles previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use diesel fuel or any other hazardous or environmentally detrimental material as a coating for the inside surface of the truck body. Cover each load at all times.

Preparation of Surfaces Prior to Paving:

- c. **Cleaning:** Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.
- d. **Patching and Leveling Courses:** Where the HMA is to be placed on an existing pavement which is irregular, wherever the plans indicate, or if directed by the Engineer, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.
- e. **Application over Surface Treatment:** Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.
- f. **Tack Coat:** Apply a tack coat on existing pavement structures that are to be overlaid with an asphalt mix and between successive layers of all asphalt mixes, unless directed otherwise by the Engineer. Use a tack coat product meeting FDOT Section 300 (Prime and Tack Coats for Base Courses). Use an emulsified tack coat spread rate of 0.02 to 0.08 gal/sy or as specified by the Engineer.

Paving:

- g. **Alignment of Edges:** With the exception of pavements placed adjacent to curb and gutter or other true edges,

place all pavements by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than ± 1.5 inches from the stringline.

- h. **Rain and Surface Conditions:** Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in subarticle E.3 above, the Contractor may then place the mixture caught in transit.
- i. **Checking Depth of Layer:** Check the depth of each layer at frequent intervals, and make adjustments when the thickness exceeds the allowable tolerance of 1/4". Address any material outside of this tolerance per the direction of the Engineer. When making an adjustment, allow the paving machine to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.
- j. **Hand Spreading:** In limited areas where the use of the spreader is impossible or impracticable, spread and finish the mixture by hand.
- k. **Spreading and Finishing:** Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.
- l. **Thickness of Layers:** Construct each course of Type SP mixtures in layers of thickness pursuant to subarticle A.6.a above.

Leveling Courses:

- m. **Patching Depressions:** Before spreading any leveling course, fill all depressions in the existing surface more than 1 inch deep by spot patching with leveling course mixture, and compact thoroughly.
- n. **Spreading Leveling Courses:** Place all courses of leveling with an asphalt paver or by the use of two motor graders, one being equipped with a spreader box. Other types of leveling devices may be used upon approval by the Engineer.
- o. **Rate of Application:** When using Type SP-9.5 (fine graded) for leveling, do not allow the average spread of a layer to be less than 50 lb/yd² or more than 75 lb/yd². The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

Compaction:

- p. For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

- q. When density testing for acceptance is required (Asphalt Work Category 3), select equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.
- r. When density testing for acceptance is not required (Asphalt Work Categories 1 and 2), use a rolling pattern approved by the Engineer.
- s. Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

Joints.

- t. Transverse Joints: Construct smooth transverse joints, which are within 3/16 inch of a true longitudinal profile when measured with a 15 foot manual straightedge.
- u. Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Do not construct longitudinal joints in the wheelpaths. The Engineer may waive these requirement where offsetting is not feasible due to the sequence of construction.

Surface Requirements: Construct a smooth pavement with good surface texture and the proper cross-slope.

- v. Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with the requirements below for Correcting Unacceptable Pavement.
- w. Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents.
- x. Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FM 5-509. Make them available at the job site at all times during paving operations for Asphalt Work Category 3 and make them available upon request of the Engineer for Asphalt Work Categories 1 and 2.

1) Asphalt Work Category 3:

- a) Acceptance Testing: Using a rolling straightedge, test the final Type SP structural layer and the Type FC layer, where a friction course is called for in the Contract Documents. Test all pavement lanes where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

- b) Rolling Straightedge Exceptions: Testing with the rolling straightedge will not be required in the following areas: intersections, tapers, crossovers, parking lots and similar areas. In addition, testing with the rolling straightedge will not be performed on the following areas when they are less than 50 feet in length: turn lanes, acceleration/deceleration lanes and side streets. However, correct any individual surface irregularity in these areas that deviates from the plan grade in excess of 3/8 inch as determined by a 15 foot manual straightedge, and that the Engineer deems to be objectionable, in accordance with the requirement below for Correcting Unacceptable Pavement. The Engineer may waive or modify straightedging requirements if no milling, leveling, overbuild or underlying structural layer was placed on the project and the underlying layer was determined to be exceptionally irregular.

- c) Final Type SP Structural Layer: Straightedge the final Type SP structural layer with a rolling straightedge behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 3/16 inch in accordance with the requirements below for Correcting Unacceptable Pavement (structural layer). If the Type SP layer is to be the final surface, corrections may be waived by the Engineer. Retest the corrected areas.

- d) Friction Course Layer: Where a friction course is called for in the Contract, at the completion of all paving operations, straightedge the friction course either behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 3/16 inch in accordance with the requirements below for Correcting Unacceptable Pavement (friction course), unless waived by the Engineer. Retest all corrected areas.

- 2) Asphalt Work Categories 1 and 2: If required by the Engineer, straightedge the final structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. Correct all deficiencies in excess of 5/16 inch in accordance with the requirements below for Correcting Unacceptable Pavement (structural layer). Retest all corrected areas. If the Engineer determines that the deficiencies on a bicycle path are due to field geometrical conditions, the Engineer will waive corrections with no deduction to the pay item quantity.

y. Correcting Unacceptable Pavement:

- 1) General: Correct all areas of unacceptable pavement at no additional cost.
- 2) Structural Layers: Correct deficiencies in the Type SP structural layer by one of the following methods:
 - a) Remove and replace the full depth of the layer, extending a minimum of 50 feet on both sides of the defective area for the full width of the paving lane.

- b) Mill the pavement surface to a depth and width that is adequate to remove the deficiency. (This option only applies if the structural layer is not the final surface layer.)
- 3) Friction Course: Correct deficiencies in the friction course layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on both sides of the defective area for the full width of the paving lane.

F. Acceptance of the Mixture.

General: The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

- a. Asphalt Work Category 1 – Certification by the Contractor as defined below.
- b. Asphalt Work Category 2 – Certification and quality control testing by the Contractor as defined below.
- c. Asphalt Work Category 3 – Quality control testing by the Contractor and acceptance testing by the Engineer as defined below.

Certification by the Contractor: On Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project was in substantial compliance with the Specifications. The Engineer may run independent tests to determine the acceptability of the material.

Certification and Quality Control Testing by the Contractor: On Asphalt Work Category 2 construction, submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project was in substantial compliance with the Specifications, along with supporting test data documenting all quality control testing as described in the Quality Control Sampling and Testing Requirements (subarticle F.3.a. below). If so required by the Contract, utilize an Independent Laboratory as approved by the Engineer for the quality control testing. The mix will also require visual acceptance by the Engineer. In addition, the Engineer may run independent tests to determine the acceptability of the material.

- d. Quality Control Sampling and Testing Requirements:
 - 1) Perform quality control testing at a frequency of once per day. Obtain the samples in accordance with FDOT Method FM 1 T 168.
 - 2) Test the mixture at the plant for gradation (P-8 and P-200) and asphalt binder content (Pb).
 - 3) Test the mixture on the roadway for density using six-inch diameter roadway cores obtained at a frequency of three cores per day.
 - 4) Determine the asphalt content of the mixture in accordance with FM 5 563.
 - 5) Determine the gradation of the recovered aggregate in accordance with FM 1 T 030.

- 6) Determine the roadway density in accordance with FM 1 T 166. The minimum roadway density will be based on the percent of the maximum specific gravity (G_{mm}) from the approved mix design. If the Contractor or Engineer suspects that the mix design G_{mm} is no longer representative of the asphalt mixture being produced, then a new G_{mm} value will be determined from plant-produced mix with the approval of the Engineer. Roadway density testing will not be required in certain situations as described in the Acceptance Testing Exceptions (subarticle F.4.a below).

- 7) Assure that the asphalt content, gradation and density test results meet the criteria in Table 3 below.

Table 3 Quality Control and Acceptance Values	
Characteristic	Tolerance
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 8 Sieve (percent)	Target ± 6.00
Passing No. 200 Sieve (percent)	Target ± 2.00
Roadway Density (average of three cores)	91.5% G _{mm}
Roadway Density (any single core)	90.0 % G _{mm}

Quality Control Testing by the Contractor and Acceptance Testing by the Engineer: On Asphalt Work Category 3, perform quality control testing as described in the Quality Control Sampling and Testing Requirements (subarticle F.3.a above). In addition, the Engineer will accept the mixture at the plant with respect to gradation (P-8 and P-200) and asphalt binder content (Pb). The mixture will be accepted on the roadway with respect to density. The Engineer will sample and test the material as described in subarticle F.3.a above. The Engineer will randomly obtain at least one set of samples per day. Assure that the asphalt content, gradation and density test results meet the criteria in Table 3 above. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer.

e. Acceptance Testing Exceptions:

- 1) When the total quantity of any mix type in the Project is less than 500 tons, or on Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. The Engineer may run independent tests to determine the acceptability of the material.
- 2) Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, variable thickness overbuild courses, leveling courses, first lift of asphalt base course placed on subgrade, miscellaneous asphalt pavement, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 lbs/sy. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet in length: crossovers, intersections, turning lanes, acceleration lanes, deceleration lanes, or ramps.

Compact these courses in accordance with a standard rolling procedure approved by the Engineer. In the event that the rolling procedure deviates from the approved procedure, placement of the mix will be stopped.

G. Method of Measurement.

For the work specified under this Article, the quantity to be paid for will be the weight of the mixture, in tons.

The bid price for the asphalt mix will include the cost of the liquid asphalt or the asphalt recycling agent and the tack coat application as specified herein.

H. Basis of Payment.

No separate pay item(s) for Hot Mix Asphalt will be provided under this contract.

- f. Remove or add any additional subgrade necessary to meet final elevation for a new 6" thick limerock base and a 1" thick Hot Mix Asphalt (HMA) pavement layer.
- g. Provide and compact new limerock base to obtain a minimum density of 98% of modified Proctor maximum density as determined by FM 1-T 180, Method D.
- h. Construct a minimum 1" thick HMA pavement layer (Type SP-9.5).

Dispose of all excess materials and debris properly.

D. Method of Measurement

The quantity to be paid for will be the area, in square yards, of approved HMA or concrete pavement transition, measured and accepted by the Engineer.

E. Basis of Payment

No separate pay item(s) for Driveway Transition will be provided under this contract.

335 DRIVEWAY TRANSITIONS (REV. 06-23-11)

A. Description

General: Where required by the Contract Documents or directed by the Engineer, transition the driveway to meet the elevation of a newly constructed and abutting sidewalk or roadway.

B. Materials

Meet the following requirements:

- a. Limerock (FDOT Section 911)
- b. Concrete (FDOT Section 347; minimum compressive strength of 3,000 p.s.i. at 28 days)
- c. Hot Mix Asphalt; refer to HMA Specifications in these Contract Documents.
- d. Expansion Joints (FDOT 932-1.1)

C. Preparation and Construction

Full-depth saw cut a neat line along the entire width of the driveway where it abuts the new sidewalk or roadway and remove existing concrete or asphalt to provide for a maximum transition slope of 2" per foot.

Concrete Driveways:

- a. Remove or add any additional subgrade material necessary to meet final elevation requirements.
- b. Add the necessary amount of limerock to rework the rock base and compact to a minimum of 95% of AASHTO T 99 density.
- c. Construct a 6" thick concrete pavement.
- d. Form a ½ inch expansion joint between the sidewalk and the driveway or at fixed objects and driveway intersections.
- e. Finish surface of concrete to match existing driveway.

Asphalt Driveways:

339 MISCELLANEOUS ASPHALT PAVEMENT (REV. 08-25-11)

A. Description.

Construct asphalt pavement in areas where vehicular traffic does not travel, such as pavement under guardrail, bicycle paths, median pavement, sidewalks, etc.

Chemically treat the underlying soil to prevent plant growth.

B. Materials.

Use a plant-mixed hot bituminous mixture, other than an open-graded friction course (FC-5), meeting the requirements of a mix design approved by Engineer. For bicycle paths, use a mixture that produces a finished pavement which will not distort or mar under bicycle or commercial riding mower wheel loads.

C. Foundation.

Shape the soil in areas where pavement is to be constructed to a surface true to the lines, grades and typical cross-sections shown in the Plans.

Compact the soil to a firm unyielding state.

D. Soil Treatment.

Immediately before placing the pavement, uniformly apply a pre-emergent herbicide to the foundation soil meeting the following requirements:

- a. Use only products approved by the Florida Department of Agriculture for the State of Florida found on www.flpesticide.us/ website.
- b. Ensure that the herbicide carries an approved label for use under paved surfaces, and that herbicide is applied in accordance with directions on the label.
- c. Do not use any products in the sulfonylurea family of chemicals.

Herbicide application by broadcast spraying is not allowed.

Prevent damage to any adjacent vegetation during herbicide application. Replace, at no expense to the Department, any plants damaged as the result of soil treatment outside designated areas.

Ensure that all employees applying insecticides and herbicides possess a current Florida Department of Agriculture Commercial Applicator license with the categories of licensure in Right-of-Way Pest Control and Aquatic Pest Control. Ensure that employees who work with herbicides comply with all applicable Federal, State, and local regulations. If application of synthetic organo-auxin herbicides is necessary, meet the requirements of Chapter 5E-2, Florida Administrative Code.

E. Placing Mixture.

Uniformly place the hot bituminous mixture by machine or hand methods at the rate of spread or dimensions indicated in the plans or as otherwise directed by Engineer.

If posts are to be constructed within the pavement area, the Contractor may cut holes for installation through the completed pavement.

After completing installation of posts and compaction of the backfill material, patch the area around each post with fresh hot bituminous mixture.

If directed by the Engineer, place miscellaneous asphalt pavement prior to placement of the final surface course.

F. Compacting Mixture.

Uniformly compact the hot bituminous mixture with lightweight rollers or vibratory compactors as directed by Engineer. The Contractor may use hand tamps for compaction in areas which are inaccessible to other compaction equipment.

G. Surface Requirements.

Provide a finished surface that is reasonably smooth, of uniform texture, and shaped so as to drain without ponding of water.

Upon completion of the pavement, shape the surface of the adjacent earth to match the pavement edges.

H. Method of Measurement.

The quantity to be paid for will be the weight, in tons, determined by an electronic weighing system as described in FDOT 320-2.2. The pay quantity will be

based on the average spread rate of the area shown on the Plans or authorized by the Engineer.

For calculation, a weight of 100 lbs/yd² per inch thickness of asphalt will be used.

Prepare a Certification of Quantities for the miscellaneous asphalt pavement pay item, based on the quantity of asphalt accepted by the Engineer. The certification must be provided monthly with each payment request and include the Contract Number, Certification Number, Certification Date, period represented by Certification, and the tons of miscellaneous asphalt pavement for the period.

I. Basis of Payment.

Price and payment will be full compensation for all work specified in this Article, including shaping and compacting the foundation, soil sterilization treatment, furnishing of the bituminous material used in the mixture, and shaping of adjacent earth surfaces.

No separate pay item(s) for Miscellaneous Asphalt Pavement will be provided under this contract.

344 PORTLAND CEMENT CONCRETE (REV. 10-26-11)

A. Description.

Use concrete composed of a mixture of Portland cement, aggregates, and water, with or without chemical or mineral admixtures. Construct Concrete based on the type of work as described in the Contract Documents and the Concrete Work Categories below.

- a. Concrete Work Category 1: Includes the construction of sidewalks, curb and gutter, ditch and slope pavement, or other non-reinforced cast-in-place or precast elements.
- b. Concrete Work Category 2: Includes the construction of precast concrete including concrete barriers, traffic railing barriers, parapets, sound barriers, inlets, manholes, junction boxes, pipe culverts, storm sewers, box culverts, prestressed concrete poles, concrete bases for light poles, highway sign foundations, retaining wall systems, traffic separators or other structural precast elements.
- c. Concrete Work Category 3: Includes the work associated with the placement and/or construction of structural cast-in-place concrete requiring a class of concrete specified in FDOT Section 346.

B. Materials.

General: Certify that all materials used in concrete meet the following requirements:

Portland Cement:	FDOT Section 921 except Portland cements meeting the requirements of AASHTO M-85 or ASTM C-150 are allowed for nonstructural concrete.

Coarse Aggregate:	FDOT Section 901
Fine Aggregate:	FDOT Section 902
Water:	FDOT Section 923
Chemical Admixtures:	FDOT Section 924
Pozzolans and Slag:	FDOT Section 929

Admixture Requirements: Chemical admixtures may be added at the dosage rates recommended by the manufacturer.

Material Storage: Use a concrete production facility that meets the following requirements.

- a. Cementitious Materials Storage: Provide a separate and clearly labeled weatherproof facility to store each brand or type of cementitious material without mixing or contamination. Different brands of cement, cement of the same brand from different facilities, or different types of cement must be stored separately and must not be mixed. Provide a suitable, safe and convenient means of collecting cementitious material samples at each storage facility.
- b. Aggregate Storage: Provide suitable bins, stockpiles or silos to store and identify aggregates without mixing, segregating or contaminating different grades or types of materials. Identify aggregate type/gradation. Handle the aggregates in a manner to minimize segregation and meet the specification requirements when recovered from storage. Continuously and uniformly sprinkle coarse aggregate with water, for 24 hours preceding introduction into the concrete mix. Timers may be used to facilitate the sprinkling of aggregate stockpiles using an alternating on/off method. However, in no event shall the top surface of the stockpile be permitted to become dry prior to batching of concrete. Moisture probes may be used to determine the moisture content of the aggregate. Ensure that the accuracy of the probe is certified annually and verified weekly. Maintain stored aggregates in a well-drained condition to minimize free water content. Provide access for the Engineer to sample the aggregates from the recovery side of the storage facility.

C. Production, Mixing and Delivery of Concrete.

Concrete Production Requirements:

- a. Use concrete production facilities certified by the National Ready-Mixed Concrete Association (NRMCA) and approved by the FDOT.
- b. Produce concrete utilizing equipment that is in good operating condition and operated in a manner to ensure a consistent product. When moisture probes are not used, ensure that the concrete production facility determines the free moisture for the coarse and fine aggregates within two hours prior to each day's batching. On concrete placements expected to exceed three hours, perform an additional moisture test approximately half way through the batching operations and adjust batch proportions accordingly.

- c. Ensure that the calibration of the measuring devices of the concrete production facilities meets the requirements of Chapter 531 of the Florida Statutes, and are in accordance with Chapter 9.2 of the FDOT Materials Manual. At least quarterly, ensure that all scales, meters and other weighing or measuring devices are checked for accuracy by a qualified representative of a scale company registered with the Bureau of Weights and Measures of the Florida Department of Agriculture. As an alternative, the producer may have this frequency identified in an FDOT approved QC plan. The accuracy of admixture measuring dispensers will be certified annually by the admixture supplier.
- d. When Volumetric Mixers are used for Category I applications, deliver concrete in accordance with the requirements of Volumetric Mixer Manufacturers Bureau (VMMB) and ensure that the vehicle has a VMMB registered rating plate.

Classes of Concrete: Classes of concrete to be used on the Project will be as specified in the Contract Documents or FDOT Section 346 when applicable.

Contractors Quality Control: Provide Engineer for approval a Quality Control (QC) plan to identify to the Department how quality will be ensured at the project site. During random inspections Engineer will use this document to verify that the construction of the Project is in agreement with the QC plan and the Contract Documents.

Concrete Mix Design:

- e. Before producing any concrete, submit the proposed mix design to Engineer on a form provided by the Department. Otherwise, the Department may accept applicable mix designs previously described in an FDOT approved QC plan. In any event, use only concrete mix designs having prior approval of the Engineer.
- f. Materials may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required original approved design mix data and batch adjustments and substituted material on a Department approved concrete delivery ticket. Engineer may disqualify any concrete production facility for non-compliance with specification requirements.

Delivery:

- g. For cast-in-place applications, the maximum allowable mixing and agitation time of concrete is 90 minutes.
- h. Furnish a delivery ticket on a form approved by the Department with each batch of concrete before unloading at the placement site. The delivery ticket shall be printed. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batchers responsible for producing the concrete certifies that the batch was produced in accordance with these Specifications and signs the delivery ticket. Contractor must sign the delivery ticket certifying that the concrete was batched, delivered and placed in accordance with these Specifications.
- i. The Contractor is responsible for rejecting loads of concrete that do not meet the plastic properties of the

approved mix design or the minimum compressive strength requirements.

- j. At the sole option of the Department, the Engineer may accept concrete at a reduced pay when it is determined that the concrete will serve its intended function.

Placing Concrete:

k. Concreting in Cold Weather:

- 1) Do not place concrete when the temperature of the concrete at placement is below 45°F.
- 2) Meet the air temperature requirements for mixing and placing concrete in cold weather as specified in FDOT Section 346. During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the concrete and air within the enclosure can be kept above 60°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.
- 3) Assume all risks connected with the placing and curing of concrete. Although Engineer may give permission to place concrete, Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the County.

l. Concreting in Hot Weather:

- 1) Meet the temperature requirements and special measures for mixing and placing concrete in hot weather as specified in FDOT Section 346.
- 2) When the temperature of the concrete as placed exceeds 75°F, incorporate in the concrete mix a water-reducing retarder or water reducer if allowed by FDOT Section 346.

- m. Spray reinforcing steel and metal forms with cool fresh water just prior to placing the concrete in a method approved by the Engineer.

- n. Assume all risks connected with the placing and curing of concrete. Although Engineer may give permission to place concrete, Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the County.

Mixers: Ensure that mixers are capable of combining the components of concrete into thoroughly mixed and uniform mass, free from balls or lumps of cementitious materials, and capable of discharging the concrete uniformly. Operate concrete mixers at speeds per the manufacturer's design. Do not exceed the manufacturer's rated capacity for the volume of mixed concrete in the mixer, mixing drum, or container.

Small Quantities of Concrete: With approval of the Engineer, small quantities of concrete, less than 3 yd³ placed in one day and less than 0.5 yd³ placed in a single placement may be accepted using a pre-bagged mixture. The Department may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's

recommendations and will meet the requirements of this Specification.

Sampling and Testing:

- o. Category 1: Engineer may sample and test the concrete at his discretion to verify its quality. The minimum 28 day compressive strength requirement for this concrete is 3,000 psi.
- p. Category 2: Provide a statement of certification from the manufacturer of the precast element that the element meets the quality control and inspection testing requirements of the Contract Documents.
- q. Category 3: The Department will randomly select a sample from each 200 yd³ or one day's production to determine plastic properties and to make three 4 x 8 inch cylinders for testing by the Department at 28 days to ensure that the design compressive strength has been met. The Department may, at its discretion, test additional concrete samples to ensure compliance with the Specifications.

Records: Maintain the following records for review for at least 3 years after final acceptance of the Project:

- r. Approved concrete mix designs.
- s. Materials source (delivery tickets, certifications, certified mill test reports).
- t. A copy of the scale company or testing agency report showing the observed deviations from quantities checked during calibration of the scales and meters.
- u. A copy of the documentation certifying the admixture weighing/measuring devices.
- v. For non structural concrete, the Department will accept recent NRMCA, VMMB or FDOT inspection records certifying the plant or truck can produce concrete. In addition, documentation will be available at the plant or in the truck showing that action has been taken to correct deficiencies noted during the inspections.

D. Acceptance of the Work.

Category 1 Work: Category 1 work will be accepted based upon compliance with Production, Mixing and Delivery Requirements specified in herein.

Category 2 Work: Precast elements will be accepted based upon certification from the Contractor that the elements were produced by a production facility on the FDOT's current approved plant list. In addition, the producers QC stamp will be displayed on the element.

Category 3 Work: Category 3 work shall be in full compliance with this Specification, and with current FDOT Specifications, FDOT Section 346 and associated Contractor Quality Control (QC) specifications governing cast-in-place concrete. In addition, a Delivery Ticket as described in Subarticle 344-B.5 will be required for acceptance of the material at the Project site.

E. Method of Measurement.

The quantities to be paid for will be the concrete items having awarded Contract Prices that are completed and accepted by Engineer.

F. Basis of Payment.

Prices and payments will be full compensation for all work and materials specified in this Article and the Articles applicable to the items of work having awarded Contract Prices measured and approved for payment.

422-2-6	6" Concrete Pavement (Includes Reinforcement Steel)	SY

**425 INLETS, MANHOLES AND JUNCTION BOXES
(SECTION 425)**

- A. Page 417, Subarticle 425-6.6 - Placing Pipe; The third sentence of this sub-article is modified to read:

When catch basins are called for, the inlet and outlet pipe may extend into the structure not to exceed 4 inches beyond the interior face of the wall.

- B. Page 417, Subarticle 425-6.7 Backfilling; is modified to include the following:

Select material shall be used for backfill adjacent to catch basins and riser inlets, as detailed in the Plans. It shall consist of well-graded limerock or limerock and sand fill. Sand or fill having a high proportion of sand will not be accepted as select fill. All select fill shall be approved by the Engineer prior to placing. No separate payment will be made for select fill, but shall be included in the unit bid price for each particular item as indicated in the Bid Form of the Proposal.

- C. Page 417, Subarticle 425-8.2 - Adjusted Structures; is expanded to include the following:

Upon completion of the work, and prior to acceptance and final payment, all such structures will be inspected by the Engineer to ensure that they are free of all debris and thoroughly cleaned. All drainage structures within the project limits shall be cleaned thoroughly and made free of all debris prior to final acceptance by the County. The Contractor shall include within the scheduled items listed on the Contract's Bid Form, the cost of all work necessary for cleaning and debris removal.

- D. Page 418, Subarticle 425-8.3 – Payment Items; is expanded to include the following:

When a separate item is listed on the Bid Form for cleaning of structures, said item shall only be used when indicated on the Engineering Plans or as directed by the Engineer, and only for the cleaning of drainage structures that were not impacted by construction activities.

<<No separate pay item(s) for Inlets, Manholes and Junction Boxes will be provided under this contract.>>

Payment will be made under:

425A ADJUSTMENT OR RELOCATION OF VALVE, METER AND JUNCTION BOXES

The work under these pay items includes any adjustments (raising or lowering) of existing boxes or fire hydrants. When relocation of the box is required, the Contractor shall make all necessary arrangements with the utility companies, as the utility companies are responsible to relocate the valves and meters and valve and meter boxes.

Payment shall be made under the following:

Item Number	Description	Unit
425-2-6	Concrete curb type D	LF

430 PIPE CULVERTS (REV. 01-12-16)

- A. Description.

Furnish and install drainage pipe and end sections at the locations called for in the Plans or as directed by Engineer. Furnish and construct joints and connections to existing pipes, catch basins, inlets, manholes, walls, etc., as may be required to complete the work.

Construct structural plate pipe culverts or underdrains in accordance with FDOT Sections 435 and 440.

Obtain pipe culverts from a Producer currently on the FDOT's list of Producers with Accepted Quality Control Programs. Producers seeking inclusion on the list shall meet the requirements of FDOT 105-3.

When the producer's FDOT Quality Control Program is suspended, accept responsibility of either obtaining drainage products from another producer with an accepted FDOT Quality Control Program or await re-approval of the producer's FDOT Quality Control Program. Engineer will not allow changes in Contract Time or completion dates as a result of the producer's FDOT Quality Control Program suspension. Accept responsibility for all delay costs or other costs associated with the producer's FDOT Quality Control Program suspension.

- B. Materials.

Pipe: Meet the following requirements:

Concrete Pipe	FDOT Section 449
Round Rubber Gaskets	FDOT Section 942
Corrugated Steel Pipe and Pipe Arch	FDOT Section 943
Corrugated Aluminum Pipe and Pipe Arch	FDOT Section 945
Corrugated Polyethylene Pipe	FDOT Section 948
Polyvinyl Chloride (PVC) Pipe	FDOT Section 948

Joint Materials: Use joint materials specified in this Article according to type of pipe and conditions of usage.

Mortar: Use mortar composed of one part portland cement and two parts of clean, sharp sand, to which mixture Contractor may add hydrated lime in an amount not to exceed 15% of the cement content. Use mortar within 30 minutes after its preparation.

- C. Type of Pipe to Be Used.

When the Plans designate a type (or types) of pipe, use only the type (or choose from the types) designated.

If the Plans do not designate a type (or types) of pipe, Contractor, subject to Engineer's approval, may use either a minimum Class I concrete pipe, corrugated steel pipe, corrugated aluminum pipe, corrugated polyethylene pipe or PVC pipe. If one of the metal types is chosen, use the minimum gage specified in FDOT Section 943 for steel pipe or FDOT Section 945 for aluminum pipe.

Class I corrugated Polyethylene Pipe may be used on local (non-arterial or non-collector) roads only.

D. Laying Pipe.

General:

- a. Lay all pipe, true to the lines and grades given, with hubs up and tongue end fully entered into the hub. When pipe with quadrant reinforcement or circular pipe with elliptical reinforcement is used, install the pipe in a position such that the manufacturer's marks designating "top" and "bottom" of the pipe are not more than five degrees from the vertical plane through the longitudinal axis of the pipe. Do not allow departure from and return to plan alignment and grade to exceed 1/16 inch per foot of nominal pipe length, with a total of not more than 1 inch departure from theoretical line and grade. Take up and relay any pipe that is not in true alignment or which shows any settlement after laying at no additional expense to the Department.
- b. Do not use concrete pipe with lift holes except round pipe which has an inside diameter in excess of 54 inches or any elliptical pipe.
- c. Repair lift holes, if present, by use of a hand-placed, stiff, non-shrink, 1-to-1 mortar of cement and fine sand, after first washing out the hole with water. Completely fill the void created by the lift hole with mortar. Cover the repaired area with a 24 by 24 inches piece of filter fabric secured to the pipe. Use a Type D-3 filter fabric meeting the requirements shown on FDOT Design Standards, Index 199 and the Contract Documents.
- d. Secure the filter fabric to the pipe using a method that holds the fabric in place until the backfill is placed and compacted. Use a grout mixtures, mastics, or strapping devices to secure the fabric to the pipe.
- e. When installing pipes in structures, construct inlet and outlet pipes of the same size and kind as the connecting pipe shown in the Plans. Extend the pipes through the walls for a distance beyond the outside surface sufficient for the intended connections, and construct the concrete around them neatly to prevent leakage along their outer surface as shown on the FDOT Design Standards, Index 201. Keep the inlet and outlet pipes flush with the inside of the wall. Resilient connectors as specified in FDOT 942-3 may be used in lieu of a masonry seal.
- f. Furnish and install a filter fabric jacket around all pipe joints and the joint between the pipe and the structure in accordance with FDOT Design Standards, Index Nos. 201 and 280. Use fabric meeting the physical requirements of Type D-3 specified on the FDOT Design Standards, Index 199 and the Contract Documents. The fabric shall extend a minimum of 12

inches beyond each side of the joint or both edges of the coupling band, if a coupling band is used. The fabric shall have a minimum width of 24 inches, and a length sufficient to provide a minimum overlap of 24 inches. Secure the filter fabric jacket against the outside of the pipe by metal or plastic strapping or by other methods approved by Engineer.

g. Meet the following minimum joint standards:

Pipe Application	Minimum Standard
Storm and Cross Drains	Water-tight
Gutter Drain	Water-tight
Side Drains	Soil-tight

- h. When rubber gaskets are to be installed in the pipe joint, the gasket shall be the sole element relied on to maintain a tight joint. Soil tight joints must be watertight to 2 psi. Water-tight joints must be water-tight to 5 psi unless a higher pressure rating is required in the Plans.

Trench Excavation: Excavate the trench for storm and cross drains, and side drains as specified in the Contract Documents.

Foundation: Provide a suitable foundation, where the foundation material is of inadequate supporting value, as determined by Engineer. Remove the unsuitable material and replace it with suitable material, as specified in Article 120 (Earthwork and Related Operations) of these Specifications. Where in Engineer's opinion, the removal and replacement of unsuitable material is not practicable, he may direct alternates in the design of the pipe line, as required to provide adequate support. Minor changes in the grade or alignment will not be considered as an adequate basis for extra compensation. Do not lay pipe on blocks or timbers, or on other unyielding material, except where the use of such devices is called for in the Plans.

Backfilling: Backfill around the pipe as specified in Article 120 (Earthwork and Related Operations) of these Specifications unless specific backfilling procedures are described in the Contract Documents.

Plugging Pipe:

- i. When existing pipe culverts are to be permanently placed out of service, fill them with flowable fill that is non-excavatable, contains a minimum 350 lbs/cy of cementitious material and meets the requirements Article 121 (Flowable Fill) and/or plug them with masonry plugs as required by the Contract Documents. Install masonry plugs that are a minimum of 8 inches in thickness, in accordance with FDOT Design Standards Index 280.
- j. When proposed or existing pipe culverts are to be temporarily placed out of service, plug them with prefabricated plugs as shown in the Plans. Install prefabricated plugs in accordance with the manufacturer's recommendations. Do not fill, or construct masonry plugs in, any pipe culverts intended for current or future service.

End Treatment:

- k. Place an end treatment at each storm and cross drain, and side drain as shown in the Plans. Refer to the FDOT Design Standards for types of end treatment details.
- l. As an exception to the above, when concrete mitered end sections are permitted, Contractor may use reinforced concrete U-endwalls, if shop drawings are submitted to Engineer for approval prior to use.
- m. Provide end treatments for corrugated polyethylene pipe and PVC pipe as specified in FDOT Section 948, or as detailed in the Plans.

Metal Pipe Protection:

- n. Apply a bituminous coating to the surface area of the pipe within and 12 inches beyond the concrete or mortar seal prior to sealing, to protect corrugated steel or aluminum pipe embedded in a concrete structure, such as an inlet, manhole, junction box, endwall, or concrete jacket.
- o. Ensure that the surface preparation, application methods (dry film thickness and conditions during application), and equipment used are in accordance with the coating manufacturers' published specifications.
- p. Obtain Engineer's approval of the coating products used.

Final Pipe Inspection:

- q. Pipe must be lay under direct supervision of Engineer at all times. In the event that a specific job site requires a video inspection, and it is approved by Engineer, pipe must be inspected as per FDOT Article 430-4.8. County will pay for the cost of inspection and report.

E. Removing Existing Pipe.

If the Plans indicate that existing pipe is to remain the property of the Department, collect and stack along the right-of-way all existing pipe or pipe arch so indicated in the Plans to be removed, or that does not conform to the lines and grades of the proposed work and that is not to be re-laid, as directed by Engineer. Take care to prevent damage to salvageable pipe during removal and stacking operations.

F. Placing Pipe Under Railroad.

General: Construct pipe culverts under railroad tracks in accordance with the requirements of the railroad company. Perform all the shoring under the tracks, and sheeting and bracing of the trench, required by the railroad company or deemed necessary by Engineer in order to ensure safe and uninterrupted movement of the railroad equipment, at no expense to the Department.

Requirements of the Railroad Company:

- a. Install pipe using methods required by the railroad company and shown in the Contract Documents.
- b. When the general method of installation required by the railroad company is indicated in the Plans, do not alter such method, or any other specific details of the installation which might be indicated in the Plans,

without receiving approval or direction from the railroad, followed by written approval from Engineer.

Notification to Railroad Company: Notify the railroad company and Engineer at least ten days prior to the date on which pipe is to be placed under the railroad tracks.

Placing Pipe by Jacking: Obtain Engineer's and the railroad company's approval of the details of the jacking method to be used, when placing pipe through the railroad embankment, before the work is started.

Use of Tunnel Liner: When the railroad company requires that a tunnel liner be used for placing the pipe in lieu of the jacking method, the Department will pay for the tunnel liner material separately in cases where the Contract Documents do not require the use of a tunnel liner. For these cases the Department will reimburse Contractor for the actual cost of the liner, delivered at the site. The Department will base such cost on a liner having the minimum gage acceptable to the railroad.

G. Specific Requirements for Concrete Pipe.

Sealing Joints: Seal the pipe joints with round rubber or profile gaskets meeting the requirements of FDOT Section 449. Ensure that the gasket and the surface of the pipe joint, including the gasket recess, are clean and free from grit, dirt and other foreign matter, at the time the joints are made. In order to facilitate closure of the joint, application of a vegetable soap lubricant immediately before closing of the joint will be permitted. Prelubricated gaskets may be used in lieu of a vegetable soap lubricant when the lubricating material is certified to be inert with respect to the rubber material.

Laying Requirements for Concrete Pipe with Rubber Gasket Joints: Do not allow the gap between sections of pipe to exceed 5/8 inch for pipe diameters of 12 inches through 18 inches, 7/8 inch for pipe diameters of 24 through 66 inches, and 1 inch for pipe diameters 72 inches and larger. Where minor imperfections in the manufacture of the pipe create an apparent gap in excess of the tabulated gap, Engineer will accept the joint provided that the imperfection does not exceed 1/3 the circumference of the pipe, and the rubber gasket is 1/4 inch or more past the pipe joint entrance taper. Where concrete pipes are outside of these tolerances, replace them at no expense to the Department. Do not apply mortar, joint compound, or other filler to the gap which would restrict the flexibility of the joint.

Field Joints for Elliptical Concrete Pipe: Use either a preformed plastic gasket material or an approved rubber gasket to make a field joint.

- a. Plastic Gasket. For field joints that are made from preformed plastic gasket material; install field joints in accordance with the manufacturer's instructions and the following:
 - 1) Material: Meet the requirements of FDOT 942-2.
 - 2) Joint Design: Ensure that the pipe manufacturer furnishes Engineer with details regarding configuration of the joint and the amount of gasket material required to affect a satisfactory seal. Do not brush or wipe joint surfaces which are to be in

contact with the gasket material with a cement slurry. Fill minor voids with cement slurry.

- 3) Primer: Apply a primer of the type recommended by the manufacturer of the gasket material to all joint surfaces which are to be in contact with the gasket material, prior to application of the gasket material. Thoroughly clean and dry the surface to be primed.
- 4) Application of Gasket: Apply gasket material to form a continuous gasket around the entire circumference of the leading edge of the tongue and the groove joint, in accordance with the detail shown on the Design Standards, Index No. 280. Do not remove the paper wrapper on the exterior surface of the gasket material until immediately prior to joining of sections. Apply plastic gasket material only to surfaces which are dry. When the atmospheric temperature is below 60°F, either store plastic joint seal gaskets in an area above 70°F, or artificially warm the gaskets to 70°F in a manner satisfactory to Engineer.
- 5) Installation of Pipe: Remove and reposition or replace any displaced or contaminated gasket as directed by Engineer. Install the pipe in a dry trench. Carefully shape the bottom of the trench to minimize the need for realignment of sections of pipe after they are placed in the trench. Hold to a minimum any realignment of a joint after the gaskets come into contact. Prior to joining the pipes, fill the entire joint with gasket material and ensure that when the pipes are joined there is evidence of squeeze-out of gasket material for the entire internal and external circumference of the joint. Trim excess material on the interior of the pipe to provide a smooth interior surface. If a joint is defective, remove the leading section of pipe and reseal the joint.

b. Rubber Gasket. For field joints that are made with profile rubber gaskets; install field joints in accordance with the manufacturer's instructions and the following:

- 1) Material: Meet the requirements of FDOT 942-4.
- 2) Joint Design: Ensure that the pipe manufacturer furnishes Engineer with details regarding configuration of the joint and gasket required to effect a satisfactory seal. Do not apply mortar, joint compound, or other filler which would restrict the flexibility of the gasket joint.

Requirements for Concrete Radius Pipe:

- c. Design: Construct concrete radius pipe in segments not longer than 4 feet (along the pipe centerline), except where another length is called for in the Contract Documents. Join each segment using round rubber gaskets. Ensure that the pipe manufacturer submits details of the proposed joint, segment length and shape for approval by Engineer, prior to manufacture.
- d. Pre-Assembly: Ensure that the manufacturer pre-assembles the entire radius section in his yard, in the presence of Engineer, to ensure a proper fit for all parts. At the option of the manufacturer, Contractor may assemble the pipe without gaskets. Consecutively number the joints on both the interior and exterior surfaces of each joint, and make match marks showing

proper position of joints. Install the pipe at the project site in the same order as pre-assembly.

H. Specific Requirements for Corrugated Metal Pipe.

Field Joints:

a. General:

- 1) Make a field joint with locking bands, as specified in Article 9 of AASHTO M 36 and AASHTO M 196M for aluminum pipe. For aluminum pipe, fabricate bands from the same alloy as the culvert sheeting.
- 2) When existing pipe to be extended is helically fabricated, make a field joint between the existing pipe and the new pipe using one of the following methods:
 - a) Cut the new pipe to remove one of the re-rolled annular end sections required in FDOT Sections 943 or 945, or fabricate the pipe so that the re-rolled annular section is fabricated only on one end. Use either a spiral (helical) band with a gasket or a flat band with gaskets as required by Subarticle 430-H.1.b.1) b) to join the pipe sections.
 - b) Contractor may construct a concrete jacket as shown on the FDOT Design Standards, Index No. 280, provided that the minimum cover required by the FDOT Design Standards, Index No. 205 can be obtained.

b. Side Drain, Storm and Cross Drain, and Gutter Drains: Where corrugated metal pipe is used as side drain, storm and cross drain, or gutter drain, use a rubber or neoprene gasket of a design shown to provide a joint as specified in Subarticle 430-D.

1) Use a gasket of one of the following dimensions:

- a) For annular joints with 1/2 inch depth corrugation: either a single gasket a minimum of 7 inches by 3/8 inch or two gaskets a minimum of 3 1/2 inches by 3/8 inch; and for annular joints with 1 inch depth corrugations: either a single gasket a minimum of 7 inches by 7/8 inch or two gaskets a minimum of 3 1/2 inches by 7/8 inch.
 - b) For helical joints with 1/2 inch depth corrugation: either a single gasket a minimum of 5 inches by 1 inch or two gaskets a minimum of 3 1/2 inches by 1 inch; and for helical joints with 1 inch depth corrugations: either a single gasket a minimum of 5 inches by 1 1/2 inches or two gaskets a minimum of 3 1/2 inches by 1 1/2 inches.
 - c) Such other gasket designs as may be approved by Engineer.
- 2) If, in lieu of a single gasket spanning the joint, two gaskets are used, place these individual gaskets approximately 2 inches from each pipe end at the joint. When two gaskets are used, seal the overlapping area on the coupling band between the gaskets consistent with the joint performance specified. Contractor may tuck a strip of preformed gasket material over the bottom lip of the band for this purpose. Use coupling bands that provide a minimum circumferential overlap of 3 inches. As the

end connections on the coupling band are tightened, ensure that there is no local bending of the band or the connection. Use precurved coupling bands on pipe diameters of 24 inches or less.

- 3) Use flat gaskets meeting the requirements of ASTM D-1056, designation 2C2 or 2B3. In placing flat gaskets on pipe prior to placing the coupling band, do not stretch the gasket more than 15% of its original circumference. Use circular gaskets meeting the requirements of ASTM C-361. Do not stretch the circular gasket more than 20% of its original circumference in placing the gasket on pipe. Use preformed plastic gasket material meeting the composition requirements of FDOT 942-2.2.
 - 4) Apply an approved vegetable soap lubricant, as specified for concrete pipe in Subarticle 430-G.1.
- c. Alternate Joint: In lieu of the above-specified combination of locking bands and flat gaskets, Contractor may make field joints for these pipe installations by the following combinations:
- 1) Use the metal bands as specified in Article 9 of AASHTO M 36M that are at least 10 1/2 inches wide and consist of a flat central section with a corrugated section near each end, designed to match the annular corrugation in the pipe with which they are to be used. Connect the bands in a manner approved by Engineer, with a suitable fastening device such as the use of two galvanized 1/2 inch diameter bolts through a galvanized bar and galvanized strap, suitably welded to the band. Use a strap that is the same gage as the band.
 - 2) Where helically corrugated pipe is to be jointed by this alternate combination, ensure that at least the last two corrugations of each pipe section are annular, and designed such that the band will engage each pipe end with the next-to-outside annular corrugation.
 - 3) For these bands, use a rubber gasket with a circular cross-section of the "O-ring" type conforming to ASTM C-361. Use gaskets having the following cross-sectional diameter for the given size of pipe:

<u>Pipe Size</u>	<u>Gasket Diameter</u>
12 inches through 36 inches (with 1/2 inch depth corrugations)	13/16 inch
42 inches through 96 inches (with 1/2 inch depth corrugations)	7/8 inch
36 inches through 120 inches (with 1 inch depth corrugations)	1 3/8 inches

- 4) Use preformed gasket material to seal the overlapping area on the coupling band between gaskets.
- 5) Use channel band couplers in helical pipe with ends which have been reformed and flanged specifically to receive these bands. Use channel band couplers that are of a two piece design, are fabricated from

galvanized steel stock conforming to AASHTO M 36, have 2 by 2 by 3/16 inch angles fastened to the band ends to allow for proper tightening, and meet the following:

<u>Band Thickness</u>	<u>Pipe Wall Thickness</u>
0.079 inch	0.109 inch or lighter
0.109 inch	0.138 inch or heavier
3/4 inch wide	0.109 inch or lighter
1 inch wide	0.138 inch or heavier

- 6) Furnish two 1/2 inch diameter connection bolts with each band, that conform to ASTM A-307, Grade A and are electroplated in accordance with ASTM B-633.
- 7) Use a gasket with the joint that is a hydrocarbon blend of butyl rubber meeting the chemical composition and physical properties of FDOT 942-2.2. Use a 3/8 by 3/4 inch gasket for pipe fabricated from 0.109 inch or lighter material and a 3/8 by 1 inch gasket for pipe fabricated from 0.138 inch and heavier material.
- 8) Contractor may use a flange band coupler without the gasket for all applications other than side drain, storm and cross drain, and gutter drain.
- 9) Do not use the flange band coupler to join dissimilar types of pipe.
- 10) Contractor may join reformed flanged helical pipe to existing annular or reformed pipe having annular ends. On non-gasketed installations, use either an annular band or an alternate joint described in Subarticle 430-H.1.c. On gasketed installations, use an annular band, minimum of five corrugations in width, in conjunction with two O-ring gaskets as specified in Subarticle 430-H.1.c. Use mastic material to seal the area of band overlap.
- 11) The minimum joint performance standards specified in Subarticle 430-D.1 applies.

Laying and Shape Requirements for Corrugated Metal Pipe:
Install pipe using either a trench or open ditch procedure.

- d. Check pipe shape regularly during backfilling to verify acceptability of the construction method used. Pipe deflected 5% or more of the certified actual mean diameter of the pipe shall be replaced at no cost to the Department. Deflection measurements are taken at the point of smallest diameter on the corrugations.

I. Specific Requirements for Corrugated Polyethylene Pipe and Polyvinyl Chloride (PVC) Pipe.

Field Joints: Use gasketed joints to seal side drain, and storm and cross drain. Use gaskets meeting the requirements of FDOT Section 449. Ensure that the pipe manufacturer provides a joint design approved by Engineer before use.

Installation Requirements Including Trenching, Foundation and Backfilling Operations: Check structure shape regularly during backfilling to verify acceptability of the construction method used.

Pipe deflected 5% or more of the certified actual mean diameter of the pipe shall be replaced at no cost to the Department.

J. Desilting Pipe Culverts, Box Culverts, and Inlet Structures.

Description. Completely remove and dispose of silt, debris, vegetation, soil, rock, and any type of blockage inside existing pipe culvert(s), box culvert(s) or inlet structure(s) specified in the Contract Documents or directed by Engineer.

General.

- a. Access to the pipe or box culvert may require temporary removal of fence, signs, guardrail, grates or manhole covers.
- b. Clean the existing pipe or box culvert by completely removing all of the silt, debris, vegetation, soil, rock, and any type of blockage to restore the hydraulic conveyance design capacity of the pipe or box culvert.
- c. Clean the existing inlet structure by completely removing all of the silt, debris, vegetation, soil, rock, and any type of blockage.
- d. Perform desilting operations in a manner not to damage the pipe culverts, box culverts, and inlet structures or surrounding area.
- e. Meet the requirements of Federal, State and local environmental standards and laws when performing all activities.
- f. Meet the requirements of Article 104 of these Specifications (Prevention, Control, and Abatement of Erosion and Water Pollution).
- g. Identify and report to Engineer necessary repairs to the pipes or box culverts and structures exposed during the desilting operation.
- h. Pipe or Box Culverts:
 - 1) Replace according to Department standards at the completion of the desilting operation or each day, as appropriate for safety.
 - 2) Align infall and outfall ditches 50 feet from the pipe or box culvert to meet the existing line and grade. If the Right-of-Way line is less than 50 feet from the pipe or box culvert, align infall and outfall ditches to the Right-of-Way line. Grade and sod any disturbed areas caused by the desilting operation.
 - 3) Dispose of all silt and debris removed in the desilting operations in areas meeting Federal, State and local rules and regulations.
 - 4) Repair or replace damage to turf, pavement, signs or structures, etc. due to negligence to the satisfaction of Engineer at no additional cost to the Department. Complete repairs prior to submission of the invoice for work accomplished.

Inspection.

- i. When directed by Engineer, de-water the pipe or box culvert to facilitate inspection.
- j. Re-clean culverts and structures determined to be unacceptable by Engineer within the time directed at no additional cost to the Department.

K. Method of Measurement.

General:

- a. The quantity to be paid for will be the number completed pursuant to these specifications that is measured and accepted by Engineer.
- b. Only items of work required by this Article that have a Contract Unit Price will be measured by Engineer for payment. All other work described in this Article that is required by the Contract Documents but does not have a Contract Unit Price is considered incidental to the Work and its costs are included among the various scheduled items of the Contract.

New Pipe: The quantities of storm and cross drain pipe, storm drain trench, side drain pipe and gutter drain pipe to be paid for will be quantity, measured in place and accepted by Engineer. The quantity of pipe will be measured from the inside wall of the structure, along the centerline of the pipe.

Mitered End Section: The quantity to be paid for will be the number completed and accepted.

Desilting Pipe Culverts, Box Culverts, and Inlet Structures:

c. General:

- 1) The cost of temporary removal and subsequent replacement of fence, signs, guardrail, grates or manhole covers will be included in the contract unit price for the related item.
- 2) Infall and outfall ditch alignment, grading and sodding will be included in the contract unit price of the related item.
- 3) Pipes or structures that are impacted by the Work must be cleaned at no cost to the County and will not be measured for payment.

d. **Desilting Pipe Culverts:** The quantities for payment will be the length in feet of existing pipe desilted and accepted by Engineer.

e. **Desilting Box Culverts:** The quantities for payment will be the volume in cubic yard of material removed from the existing box culvert as measured and accepted by Engineer.

f. **Desilting Structures:** The quantities for payment will be the number of existing Inlet Structures desilted and cleaned as counted and accepted by Engineer.

L. Basis of Payment.

General:

- a. Prices and payments will be full compensation for all work specified in this Article including:
 - 1) All excavation except the volume included in the items for the grading work on the Project, and except for other items specified for separate payment in Article 120 (Earthwork And Related Operations) of these Specifications;
 - 2) All backfilling material and compaction; disposal of surplus material; and

- 3) All clearing and grubbing outside of the required limits of clearing and grubbing as shown in the Plans.

Removing Existing Pipe: When existing pipe is removed and replaced with new pipe approximately at the same location, the cost of excavating and removing the old pipe and of its disposal will be included in the Contract unit price for clearing and grubbing.

Site Restoration: The cost of completely restoring the areas of the Project Site that is disturbed for the purpose of constructing pipe culvert is included in the Contract unit price for the pipe culvert, unless designated specifically to be paid for under other items.

Plugging Pipes:

- b. The cost of temporarily plugging a pipe culvert, either proposed or existing, will be incidental to the contract unit price for new pipe culvert.
- c. The cost of filling and/or plugging an existing pipe culvert that is to be permanently placed out of service will be paid for at the contract unit price for filling and plugging pipe, per cubic yard. Price and payment will be full compensation for flowable fill, masonry, concrete, mortar, and all labor and materials necessary to complete the work.

Desilting Pipe Culverts, Box Culverts, and Drainage Structures: Price and payment will be full compensation for furnishing all equipment, tools, labor, removal and disposal of silt, debris, vegetation, soil, rock, and any type of blockage, de-watering, erosion and water pollution control, clean up and all incidentals necessary for the satisfactory performance of the work.

Flared End Sections: Price and payment will be full compensation for all work and materials required.

Mitered End Sections: Price and payment will be full compensation for all pipe, grates when required, fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets and coupling bands, and all work required.

Railroad Requirements:

- d. Where pipe culvert is constructed under railroad tracks, the Contract unit price for the pipe culvert will include the costs of any jacking operations and the operation of placing the pipe by use of a tunnel liner, (except as specified for unanticipated tunnel liner, in Subarticle 430-F.5, where reimbursement is to be made for such unanticipated liner), and all other work necessary to meet the requirements of the railroad company, excluding the costs of watchman or flagman services provided by the railroad company, except as provided below.
- e. The Department will reimburse Contractor for the actual costs of any trestle bridge work which is performed by the railroad's forces, as billed to him by the railroad, less the value of any salvage materials derived there from, whether such salvage materials are retained by the railroad company or by Contractor. When the work of shoring and bracing is to be performed by the railroad, such fact will be stipulated in the Contract Documents and Contractor will be required to pay to the

railroad the amount of such costs, which amount will be reimbursed to him by the Department. The Contract unit price for the pipe culvert shall include the costs of all other work of shoring and bracing.

Payment Items:

- f. Payment will be made under the items below having an awarded Contract Unit Price.

Item No.	Description	Unit
430-18-4	Install 4-inch pipe HDPE VIS Horizontal Direction Drill	LF

443 FRENCH DRAINS

A. Description.

Construct french drains, utilizing one of the authorized types of pipes listed below, with coarse aggregate, and plastic filter fabric (geotextile). Construct in accordance with FDOT Design Standards, Index No. 285 as modified by or otherwise specified in the Contract Documents.

B. Materials.

Pipe: Unless a particular type is specified in the Contract Documents, pipe furnished may be any of the following types:

- a. Concrete Pipe (Bell & Spigot): Slotted or perforated concrete pipe may be used.
 - 1) Meet the requirements of FDOT 449 for concrete pipe. Use the class of pipe specified on the FDOT Design Standards, Index No. 205. Do not use gaskets. Fully insert the spigot in the bell, and bring home. Conform to FDOT Design Standards, Index No. 285 for slotted pipe. Use perforated pipe having perforations equally located 360 degrees around the pipe.
 - 2) Furnish pipe having not less than 30 round perforations, 3/8 inch each, per square foot of inside pipe surface. Extend perforations to within 6 inches of the bell or spigot area. The Engineer will permit other perforations not less than 5/16 inch nor more than 3/8 inch in the least dimension if they provide an opening area not less than 3.31 in²/ft² of pipe surface.
- b. Corrugated Aluminum Alloy Culvert Perforated Pipe:
 - 1) Meet the requirements of FDOT 945. Use perforated pipe having perforations equally located 360 degrees around the pipe. Locate perforations either on the inside crests or on the neutral axis of all corrugations except that perforations are not required within 4 inches of each end of each length of pipe or in a corrugation where seams are located.
 - 2) Furnish pipe having not less than 30 round perforations, 3/8 inch each, per square foot of pipe

- c. Corrugated Steel Perforated Pipe: Meet the requirements of FDOT 943. Space the perforations and meet the requirements as specified in b. 2) above.
- d. Bituminous Coated Corrugated Steel Perforated Pipe: Meet the requirements of FDOT 943. Space the perforations and meet the requirements as specified in b. 2) above. Place the perforations prior to the bituminous coating. The Engineer will accept the minimum opening of not less than 3.31 in²/ft² of pipe if 50% of the opening area is maintained after coating.
- e. Corrugated Polyethylene Pipe:
 - 1) Meet the requirements of FDOT 948-2.3 except that Class I corrugated Polyethylene Pipe may only be used on local roads (non-arterial or non-collector).
 - 2) Space the perforations and meet the requirements as specified in b. 2) above.
- f. Polyvinyl Chloride (PVC) Pipe: Meet the requirements of FDOT 948-1.7. Space the perforations and meet the requirements as specified in b. 2) above.

Select Fill: Use select fill meeting the requirements of either FDOT 911, 913, 913A or 915.

Carefully excavate the trench to such depths as required to permit the filter fabric, coarse aggregate and the pipe to be placed in accordance with the details shown on the Plans.

Lay all pipe conforming with the lines and grades specified in the plans and in accordance with these Specifications. Unless otherwise specified in the Plans or directed by the Engineer, set the pipe with a minimum cover of 30 inches in paved areas (24 inches for non-paved areas) and a maximum cover of 66 inches.

After placing the pipe and without disturbing the pipe, carefully place the coarse aggregate around the pipe to a depth shown in the plans. Fold the filter fabric over the coarse aggregate. Backfill and compact as described below.

- a. French Drains Under Pavement: Fill the area above the coarse aggregate with select fill material meeting the requirements of this Section. Place and compact the select fill according to the requirements for pipe as specified in the Earthwork specifications. The Department will allow use of additional coarse aggregate over the top of the pipe instead of select fill material. In this case, the filter fabric shall be extended to wrap the additional course aggregate. The top of the coarse aggregate shall not be higher than the bottom of the base, unless shown in the plans. The Department will not pay additional costs associated with substituting coarse aggregate for select fill.
- b. French Drains not Under Pavement: Fill and compact the area above the coarse aggregate according to the requirements for pipe in the Earthwork specifications, unless specific procedures are described in the Plans as specified in the Earthwork specifications.

Quantity of french drains to be paid for under this Article shall be the length in linear feet completed in accordance with Plans and specifications; measured in place and accepted by the Engineer subject to the following conditions:

- a. French drain lengths having a depth of trench less than 10 feet below land surface (BLS) will not be accepted for payment by the Engineer.
- b. For french drains with specified depth of trench of 15 feet BLS or greater, any length not meeting the specified depth for reasons approved by the Engineer will have the payment quantity calculated as:
 - 1) Quantity for Payment (LF) = Quantity Measured by the Engineer (LF) x Engineer Approved Depth Rounded to the Lowest Whole Foot (ft) / Specified Depth (ft)

The quantities determined as provided above will be paid for at the Contract unit price for french drains. Such prices and payments will be full compensation for all work, labor, equipment and material necessary for construction of the french drains as specified in these Contract Documents including excavation, sheeting or shoring if required, the disposal of surplus material, providing plastic filter fabric, pipe, course aggregate, select backfill, tamping, and final dressing.

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514 GEOTEXTILE (REV. 11-04-11)

A. Description.

Install a geotextile (plastic filter) fabric.

B. Material.

Meet the plastic filter fabric requirements as specified in FDOT 985.

Geotextile used in the Drainage class (type D-3) applications listed in FDOT Design Standards Index 199 shall be woven monofilament geotextiles only. No Slit Film geotextiles are allowed.

C. Construction Methods.

General:

- a. Place the fabric in the manner and locations as shown on the construction drawings, in accordance with the manufacturer's directions, and as specified in these Specifications.
- b. Place the fabric on areas with a uniform slope that are reasonably smooth, free from mounds and windrows, and free of any debris or projections which might damage the fabric.
- c. Loosely lay the material. Do not stretch the material.
- d. Replace or repair any fabric damaged or displaced before or during placement of overlying layers to the satisfaction of the Engineer and at no expense to the Department.
- e. When overlapping is necessary, the Contractor may sew the seams to reduce overlaps as specified in FDOT 985-3.
- f. Schedule work so that covering the fabric with the specified material does not exceed the manufacturer's recommendations for exposure to ultraviolet light or five days, whichever is less. If the Engineer determines the exposure time was exceeded, the Contractor shall replace the fabric at no expense to the Department.

Subsurface Drainage: When indicated in the plans, place the fabric with the long dimension parallel to the trench. Place the fabric to provide a minimum 12 inch overlap for each joint. Do not drop the filter material from heights greater than 3 feet.

Stabilization and Reinforcement: Overlap adjacent strips of fabric a minimum of 2 feet.

Riprap Filter:

- g. Overlap adjacent strips of fabric a minimum of 24 inches, and anchor them with securing pins (as recommended by the manufacturer) inserted through both strips of fabric along a line through the midpoint of the overlap and to the extent necessary to prevent displacement of the fabric.
- h. Place the fabric so that the upstream (upper) strip of fabric overlaps the downstream (lower) strip.

- i. Stagger vertical laps a minimum of 5 feet. Use full rolls of fabric whenever possible in order to reduce the number of vertical laps.
- j. Do not drop bedding stone or riprap from heights greater than 3 feet onto the fabric.

D. Method of Measurement.

No separate payment for furnishing and placing the geotextile fabric is contained in the Contract Documents.

E. Basis of Payment.

Item No.	Description	Unit
514-71-1A	Temporary Erosion Control LS	

519 DRIVEWAY PAVEMENT (REV. 08-23-12)

A. Description

Pursuant to the Contract Documents or as otherwise directed by the Engineer:

- a. Construct new asphalt concrete driveway approaches on public right-of-way.
- b. Restore existing asphalt or cement concrete driveways and approaches that have been authorized to be disturbed by the performance of the Work; and provide all other required labor, material and equipment necessary for complete restoration of the disturbed area.

B. Materials

Meet the following requirements:

Limerock	FDOT Section 911
Concrete	FDOT Section 350; Class I (Pavement)
Hot Mix Asphalt (HMA)	Per Article 334 of these Specifications
Joint Seal	FDOT Section 932

C. Preparation and Construction

General:

- a. Conform to applicable surface slope requirements of FDOT Index No. 304.
- b. Meet all applicable requirements of the Miami-Dade County Public Works Manual.
- c. Perform any required clearing and grubbing under Article 110 of these Specifications.
- d. Remove or add any additional subgrade material necessary to meet final surface elevation requirements after construction of a new limerock base and pavement of the thicknesses specified below.
- e. Provide a new six inch limerock base; or greater if needed to match existing. Build up in layers not to exceed three inches and compact each layer to obtain

a minimum density of 98% of modified Proctor maximum density as determined by FM 1-T 180, Method D.

- f. Maintain the area of excavation in a safe condition and level with the surrounding pavement until work is complete.
- g. Furnish and place all materials; construct all forms, joints, bracing, expansion joint materials, and accessories; apply required surface finishes; and all required clearing and grubbing, excavation and backfilling.
- h. Remove all remaining excess material, dirt, and other debris from the roadways immediately after all construction or restoration of pavement under this Article has been completed.

Cement Concrete Pavement:

- i. Concrete pavement for driveways, driveway aprons and sidewalk across driveways must be a minimum thickness of six inches. Materials and construction must conform to the requirements of FDOT Section 350.
- j. Form a ½ inch expansion joint between the sidewalk and the driveway or at fixed objects and driveway intersections.
- k. Finish surface of concrete to match existing pavement.

Asphalt Concrete Pavement:

- l. Construct a minimum one inch thick HMA pavement layer (Type SP-9.5) meeting the material and construction requirements of Article 334 of these Specifications.

Additional Requirements for Restoration of Pavement:

- m. Full-depth saw cut a smooth, straight, neat and square line along the entire width of damaged pavement that is to be restored. Immediately dispose of all excess debris properly.
- n. Restore sidewalks across driveways, cut or damaged by construction, in full sections concrete curb or gutter to the existing height and cross section in full sections or lengths between joints.

D. Method of Measurement

The quantity to be paid for will be the area, in square yards, of approved driveway pavement constructed or restored in accordance with this Article, as measured and accepted by the Engineer.

E. Basis of Payment

Price and payment will be full compensation for all work and materials specified in this Article.

- a. No separate pay item(s) for Driveway Pavement will be provided under this contract

522 CONCRETE SIDEWALK (SECTION 522)

- A. Page 589, Article 522-1, Description: Is expanded to include the following:

The work specified under this Section consists of the forming, furnishing, placement, and finishing of concrete for the construction of concrete sidewalks, pedestrian ramps and sidewalk curbs (back of sidewalk) utilizing Class I Concrete. The width, thickness and type shall be as shown and noted in the Plans. All work will be in accordance with this Section except as modified herein.

- B. Page 589, Article 522-2, Materials; is amended as follows:

Class I Concrete shall have a minimum compressive strength of 3,000 p.s.i. at 28 days.

- C. Page 591 Article 522-9, Method of Measurement; is expanded to include the following:

The quantity to be paid for under this Article shall be the area in square yards of concrete sidewalk and pedestrian ramps, measured in place, complete and accepted. Measurement shall be the final dimensions measured along the surface of the completed work within the neat lines shown on the Plans or designated by the Engineer. No deduction will be made for the area occupied by trees left within the area of sidewalks or for any area occupied by manholes, inlets or other drainage or public utility appurtenances within the sidewalk area.

- D. Page 591 Article 522-10, Basis of Payment; is deleted in its entirety and replaced with the following:

The quantity, determined as provided above, shall be paid for at the Contract unit price for the quantities completed and accepted by the Engineer. Such price and payment shall be full compensation for all work specified under this Section.

When curb and gutter is required for the construction of pedestrian ramps and no specific pay item has been included for the construction of the curb and gutter, such payment shall be included in the pay item for Sidewalk (including pedestrian ramps and sidewalk curbs).

No separate payment shall be made for the removal of forms or the filling of excavated area left by removal of forms. Contractor shall be responsible for any vandalized sidewalk until it is finally accepted by the Engineer.

No separate pay item(s) for Concrete Sidewalk will be provided under this contract.

523 PATTERNED PAVEMENT (REV. 01-06-2015)

- A. Description

Install patterned pavement on asphalt or concrete pavement areas at locations and with the color and pattern as specified in the Plans. Use products listed on the FDOT Approved Product List (APL), as approved for use in areas subject to vehicular traffic or non-vehicular traffic,

respectively, as specified herein. Install products in accordance with manufacturer's recommendations.

For the purpose of this Specification, patterned pavements are defined as a post applied surface marking overlay to either the pavement surface or to an imprinted pavement surface. Vehicular traffic areas are defined as those subject to vehicles within the traveled way, shoulders and auxiliary lanes. Non-vehicular travel areas include medians, islands, curb extensions, sidewalks, borders, plazas and other areas typically subject to foot traffic only.

Install overlay products in areas subject to vehicular traffic to a thickness not exceeding 180 mils. Do not use products requiring removal of pavement or requiring blockouts or trenches below the top of pavement.

Variations within a pattern shall comply with ADA requirements.

B. Materials

General:

- a. Use only patterned pavement products approved for use in vehicular and non-vehicular areas, as appropriate, and listed on the APL. Meet manufacturer's specifications for all patterns, textures, templates, sealers, coatings and coloring materials.
- b. Material coatings used to achieve the pattern and color shall produce an adherent, weather resistant, skid resistant, wear resistant surface under service conditions. Color shall be integral and consistent throughout the installation. The composition of materials is intended to be left to the discretion of the manufacturer.
- c. Materials shall be characterized as non-hazardous as defined by Resource Conservation and Recovery Act (RCRA), Subpart C, Table 1 of 40 CFR 261.24 "Toxicity Characteristic". Materials shall not exude fumes which are hazardous, toxic or detrimental to persons or property.

Approved Product List (APL):

- d. Manufacturers seeking evaluation of their product shall submit an application to FDOT in accordance with FDOT Section 6 along with the following documentation:
 - 1) Manufacturer's recommendations for applicability of use on concrete or asphalt surfaces.
 - 2) Manufacturer's recommendation for applicability of use in vehicular or non-vehicular travel areas.
 - 3) Manufacturer's specifications and procedures for materials and installation for each use above.
 - 4) For products proposed for use in vehicular traffic areas, independent test data verifying the material meets the requirements of this Section including verification that the product, installed in accordance with the manufacturer's specifications and procedures, has been tested in accordance with either:
 - a) ASTM E-274, Skid Resistance of Paved Surfaces using a standard ribbed full scale tire at

a speed of 40 mph (FN40R), and has a minimum FN40R value of 35, or

- b) ASTM E-1911, Measuring Paved Surface Frictional Properties Using the Dynamic Friction Tester (DFT), at a speed of 40 mph (DFT40), and has a minimum DFT40 value of 40.

- 5) For products proposed for use in non-vehicular traffic areas, independent test data verifying the material meets the requirements of this Section including verification that the product, installed in accordance with the manufacturer's specifications and procedures, has been tested in accordance with ASTM E-303 using the British Pendulum Tester and has a British Pendulum Number (BPN) of at least 40.

- 6) For products proposed for use as a bike lane application, independent testing verifying that the material can meet the color as identified in the April 15, 2011, Interim Approval for Optional use of Green Colored Pavement for Bike Lanes, Interim Approval (IA-14) Memorandum Valid Under the 2009 MUTCD (http://mutcd.fhwa.dot.gov/resources/interim_approval/ia14/ia14grnpmbiketlanes.pdf).

Performance Requirements for Products in Vehicular Travel Areas:

- e. In addition to the submittal requirements of B.2 above, APL approval will be contingent on a field service test demonstrating that the patterned pavement product meets the following performance measures at the end of three years from opening to traffic:
 - 1) The average thickness shall be a minimum of 50% of the original thickness.
 - 2) Wearing of the material coating shall not expose more than 15% of the underlying surface area as measured within the traveled way.
 - 3) Friction performance of patterned/textured pavement materials shall meet or exceed one of the following test method values:
 - a) FN40R value of 35 in accordance with ASTM E-274; or,
 - b) DFT40 value of 40 in accordance with ASTM E-1911.
 - c) Manufacturers shall provide a field service test installation of each product within a marked crosswalk on a roadway with an ADT of 6,000 to 12,000 vehicles per day per lane, on a site approved by the Department. The test installation shall be a minimum six feet wide and extend from pavement edge to pavement edge across all traffic lanes and shoulder pavement at the crosswalk location. The test installation shall be tested by the manufacturer in accordance with FM 5-592.

C. Construction

Product Submittals: Prior to installation, submit pattern and color samples to the Engineer for confirmation that the

product meets the pattern and color specified in the Plans. Do not begin installation until acceptance by the Engineer.

Pavement Cuts: Complete all utility, traffic loop detector, and other items requiring a cut and installation under the finished surface, prior to product installation.

Surface Protection: Protect treated surfaces from traffic and environmental effects until the product is completely installed, including drying and curing according to the manufacturer's instructions.

Installation Acceptance:

- For installation on new asphalt roadways, apply patterned pavement a minimum of 14 days after placement of the adjacent pavement.
- Upon completion of the installation, the Engineer will check the area at random locations for geometric accuracy. If any of the chosen areas are found to be deficient, correct the entire patterned area at no additional cost to the Department.
- Provide certification that the patterned pavement was installed in accordance with the manufacturer's requirements.

D. Method of Measurement.

The quantity to be paid will be the installed quantities in square yards of patterned pavement, completed and accepted. No deduction will be made for areas occupied by landscaping, manholes, inlets, drainage structures, or by any public utility appurtenances within the area.

E. Basis of Payment.

Price and payment will be full compensation for all work specified in this Article.

Payment will be made under:

Item	Description	Unit
526-1-2H	Concrete Pavers	SY

527 DETECTABLE WARNINGS ON WALKING SURFACES (REV. 12-20-16)

A. Description.

- Furnish and install Safety Yellow Colored Detectable Warning devices on newly constructed and/or existing concrete or asphalt walking surfaces (curb ramps, sidewalks, shared-use paths, etc.) constructed in accordance with the FDOT Design Standards Index No. 304 and these specifications, where indicated on the Plans or directed by the Engineer.

B. Materials.

- General:**

- Provide Detectable Warnings in accordance with the Americans with Disabilities Act Standards for Transportation Facilities, Section 705.
- Provide only embedded Detectable Warning devices, set in wet concrete, for all construction except where retrofit applications of surface applied detectable warnings have been approved in writing by the Engineer.
- Use Detectable Warnings consisting of materials intended for exterior use subject to routine pedestrian traffic and occasional vehicular traffic.
- Use Detectable Warnings with size and pattern shown in the plans comprised of truncated domes aligned in parallel rows in accordance with the FDOT Design Standards, Index No. 304. Do not use detectable warnings with a diagonal pattern.
- Concrete stamping, field-formed materials, or methods or products used to form Detectable Warnings in wet concrete are not permitted.

2. Material Properties:

- Provide Detectable Warnings that meet the following minimum material property requirements when tested in accordance with the indicated Standard appropriate to the material.

PROPERTY	STANDARD	TEST VALUE
Slip Resistance	FM 3-C 1028	Dry Coefficient of Friction – 0.8 min. Wet Coefficient of Friction – 0.65 min. (include recessed areas between truncated domes)
Wear Resistance	FM 5-594	Average Volume Loss: no more than 0.06 cm ³
Water Absorption*	ASTM D-570	Not to exceed 5%.
Adhesion/Bond Strength**	FM 5-589	150 psi min. tensile adhesion strength
Non-Hazardous Classification	Submit Material Safety Data Sheet (MSDS)	Non-Hazardous, per RCRA Subtitle C
* Applies only to plastic materials. ** Applies only to surface-applied materials.		

- Color/Contrast:** Use Safety Yellow colored Detectable Warnings on concrete or asphalt walking surfaces. Acceptable Detectable Warnings must maintain a Light Reflectance Value (LRV) CAP Y of 25 – 45, as measured with a spectrophotometer, for a minimum duration of three years.

4. Approved Products List:

- a. Use Detectable Warnings listed on the FDOT Approved Products List (APL) and that have been further evaluated and found acceptable by the Department. At the option of the Contractor, an "or equal" product evaluation request, for an equivalent FDOT APL approved product that meets or exceeds the specification stipulated herein, may be submitted in writing to the Engineer for review and acceptance.
- b. The following products, subject to continued listing on the FDOT APL, have been evaluated by the Department for use on Department projects:

SURFACE APPLIED DETECTABLE WARNING DEVICES		
Manufacturer	Product	APL Number
Engineered Plastics, Inc.	Armor-Tile Surface Applied Inline Dome	527-000-006
TufTile	TufTile Polymer (Surface Applied)	527-000-045
TufTile	TufTile Polymer (Surface Applied) Radius	527-000-045-RW
EMBEDDED DETECTABLE WARNING DEVICES		
Manufacturer	Product	APL Number
ADA Solutions, Inc.	Cast-In-Place Composite Tactile	527-000-003
ADA Solutions, Inc.	Replaceable Wet Set Composite	527-000-018
Engineered Plastics, Inc.	Armor-Tile Replaceable Cast in Place	527-000-026
Engineered Plastics, Inc.	Armor-Tile Cast-In-Place Inline Dome Tile	527-000-027
Cape Fear Systems, LLC	AlertCast (Replaceable) Cast-In-Place	527-000-029
Access Products, Inc.	Access Tile Replaceable Cast in Place	527-000-033
StrongGo Industries	TekWay Dome Tile	527-000-035
TufTile, Inc.	TufTile Cast Iron (Wet-set) Replaceable	527-000-044
TufTile	TufTile Polymer (Wet Set) Replaceable	527-000-046
TufTile	TufTile Polymer (Wet Set) Radius	527-000-046-RW

A. Installation Procedures.

1. Surface Preparation and Installation: Prepare the surface in accordance with the manufacturer's recommendations.

Use only products and materials appropriate for the surface on which they will be applied. Install in accordance with the manufacturer's instructions, using materials and equipment recommended and approved by the manufacturer. For surface-applied tiles or mats, use adhesives applied over the entire surface and mechanical fasteners.

B. Method of Measurement.

1. The quantity to be paid for will be the area, in square feet, of Detectable Warnings furnished and installed pursuant to these specifications, measured in place and accepted by the Engineer.

C. Basis of Payment.

1. Price and payment will be full compensation for all work specified in this Article, including all labor, surface preparation, materials and incidentals necessary to complete the work for installation of Detectable Warnings on walking surfaces.
2. No separate pay item(s) for Detectable Warning On Walking Surface will be provided under this contract.

528 RIPRAP FOR DRAINAGE STRUCTURES

A. General

This Article is for sand-cement riprap used to fill the void space adjacent to proposed inlet structures placed in existing slab-covered trenches, FDOT Section 530 is modified as follows:

Page 600, Section 530-2.1 – Materials/Sand-Cement; expand this Subarticle to include:

- a. Sand-Cement riprap to be placed in existing slab-covered trenches may consist of commercially available pre-bagged sand-cement mixes subject to the following:
 - 1) Prior to use, submit the manufacturer's product specifications and information for the proposed sand-cement product to the Engineer for approval.
 - 2) The sand-cement mix shall consist only of Portland Cement and sand meeting the requirements of FDOT Section 921 and 902-3.3 respectively.
 - 3) Sacks (bags) shall be permeable and absorptive enough to permit passage of water to provide for hydration of the cement.
 - 4) Ensure that sacks are free from holes and strong enough to withstand handling without ripping or splitting.
 - 5) Use only one type and size of pre-bagged sand-cement mix at any one structure.

Page 603, Section 530-3.1 – Construction Methods/Sand-Cement; delete this Subarticle and substitute the following:

- b. Place sand-cement sacks as shown in the engineering plans or as directed by the Engineer. Sacks are placed without ripping or splitting with its shorter dimension (width) abutting the structure. Lay the sacks in a regular pattern and pack against each other so as to form a close and molded contact after the sand and cement mixture has set up. Remove and replace sacks ripped or torn in placing with sound, unbroken sacks. Then, thoroughly saturate all sacks with water. Grouting, if required by the Engineer, shall be in accordance with FDOT 530-3.1.4.
- c. If mixing and filling sacks at the job site, the mixing and filling requirements of FDOT 530-3.1.1 (Mixing Materials) and FDOT 530-3.1.2 (Filling Sacks) shall also apply.

Page 603, Section 530-4.1 – Method of Measurements/Sand-Cement; Delete this Subarticle and substitute the following when using commercially available pre-bagged sand-cement mixes:

- d. The pay quantity for the work specified under this Section shall be the number of cubic yards of sand-cement mixture, placed in sacks or used in the grout, actually placed and accepted. For payment purposes, 1 cubic yard of sand-cement riprap shall constitute either 36 (60 lb) bags of sand-cement mixture or 27 (80 lb) bags of sand-cement mixture.

536 GUARDRAIL

A. Description.

Perform work, pursuant to the Contract Documents and the FDOT Design Standards, to include:

- a. Construction of metal guardrail on posts of timber or steel
- b. Removal of existing guardrail
- c. Construction of guardrail anchorages
- d. Replacement of guardrail posts

B. Materials.

Guardrail:

- a. Construct guardrail of the standard W-beam or thrie beam type. Use materials for the rail and rail elements meeting the steel requirements of FDOT 967-1.

Posts:

b. General:

- 1) Unless the Contract Documents or Engineer designate a particular type of post, the Contractor may choose the type of material of post to use.
- 2) Use posts of either timber, or steel, and of the sizes and dimensions specified in the Contract Documents. Use the particular type selected throughout a run of rail, except where special steel posts are required.

c. Timber Posts:

- 1) Meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber, for No.1 grade timber, and treat the posts in accordance with the requirements for posts in FDOT 955-5.3. Ensure that penetration of preservative is in accordance with requirements for round piles and fence posts in FDOT 955-6.2. Shape and drill the posts prior to treatment, and ensure that they do not vary more than 1 inch from the specified length. Dress all timber posts on all four sides (S4S).

d. Steel Posts:

- 1) Use steel posts meeting the requirements of ASTM A36 steel. Galvanize the posts in accordance with the requirements of ASTM A 123, with 2 oz/ft² of zinc coating. Drill the posts prior to galvanizing. Ensure that the manufacturer furnishes certification showing physical and chemical properties of each heat, the amount of spelter coating, and conformance to ASTM A 123.
- 2) The Contractor may use steel guardrail posts of either a rolled section or a welded structural shape with nominal dimensions as shown in the FDOT Design Standards.
- 3) For welded structural shapes, meet the following requirements:
 - a) Ensure that the design properties of the shape meet or exceed the design properties for a W 6 x 9 shape as contained in the AISC Manual of Steel Construction.
 - b) Weld in accordance with the requirements of ASTM A 769.
 - c) After cutting posts to length, place a weld to seal the spaces between the web plate and flange plates.
 - d) Galvanize as specified above after completing all drilling and welding.

Anchor Blocks:

- e. Use anchor blocks of Class I concrete, and construct and place them in accordance with the requirements shown in the Plans or as directed by the Engineer.

Offset Blocks:

- f. Use guardrail offset blocks of either timber, steel, recycled plastic, or rubber, and of the sizes specified in the FDOT Design Standards.
- g. Treat timber blocks in accordance with the requirements for posts in FDOT 955-5.3. Ensure that penetration of preservative is in accordance with requirements for round piles and fence posts in FDOT 955-6.2. For timber offset blocks, meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber, for No.1 grade timber. Dress all timber offset blocks on all four sides (S4S). Ensure that timber offset blocks do not vary more than 0.25 inch from the specified length
- h. Use rubber blocks that have a minimum Durometer hardness of 50 (ASTM D 2240), show no cracking at the end of an ozone exposure of 100 ±10 pphm for 15

hours at 100°F (ASTM D 1149 mounting type A), do not exceed 15 points change in Durometer hardness in oven ageing for 70 hours at 158°F (ASTM D 573), and show no cutting or tearing under a 6,500 lb load applied through a guardrail section. Ensure that the blocks present a neat appearance and have plane surfaces. Provide rubber blocks that are 6 inches wide, 8 inches deep and 14 inches high. Allow dimensional tolerances of $\pm 5/8$ inch in height, $\pm 3/8$ inch in width, and $\pm 3/8$ inch in depth.

- i. For Recycled Plastic offset blocks, meet the requirements of FDOT Section 972.

Reflector Elements:

- j. Provide reflectors that meet the requirements of FDOT 993-5.
- k. Mount reflectors onto the guardrail in accordance with the details shown in the Plans and the FDOT Design Standards.

Certification:

- l. Provide the Engineer, at least ten days prior to guardrail construction, a certification from the manufacturer confirming that all materials (timber or steel posts, anchor and offset blocks, reflector elements, and all other accessories) meet the requirements of the Contract Documents and the FDOT Design Standards.
- m. Furnish the Engineer a Certificate of Compliance certifying that the guardrail system, materials and construction practices, comply with applicable FDOT Design Standards and Contract Specifications.
- n. Acceptance of furnished material will be based on the Certificate of Compliance, material certification and visual inspection by the Engineer.

C. Setting Posts.

Set standard length posts vertically to the depth shown in the FDOT Design Standards. Set special length posts vertically to the depth shown in the plans. Align and realign posts as necessary, until final acceptance. Where the posts are not set in concrete or mounted on structures, backfill the post holes with suitable thoroughly tamped material. As an alternate method, the Contractor may use a post-driving machine, meeting the approval of the Engineer and capable of driving the posts without damaging them.

For guardrail post replacement, backfill and compact the existing hole prior to setting the new post.

If driving timber posts, the Contractor may either block out holes in the asphalt for the posts during the asphalt paving operation or cut holes through the asphalt mat prior to the post installation. Blocked out holes or cut holes in the asphalt pavement shall be at least 50% larger than the sectional area of the timber post. After completing driving of the posts patch the area of asphalt around each post with fresh hot bituminous mixture.

If driving steel posts, drive the post directly through the asphalt mat. Fill depressions or cracks with fresh, hot bituminous mixture in a manner meeting the approval of the Engineer.

For either timber or steel post locations, in which rock, concrete or asphalt thicker than 2 inches exist, remove such material and backfill with suitable material, thoroughly tamped as detailed in the FDOT Design Standards.

D. Erection of Rail

Erect the guardrail panels, supports, anchors, etc., as shown in the FDOT Design Standards.

E. Existing Guardrail.

Stockpile guardrail, so specified, within the right-of-way at a location approved by the Engineer. Dispose of all remaining guardrail not specified for stockpiling.

F. Method of Measurement.

Guardrail:

- a. The quantity to be paid for will be the length, in feet, constructed, in place and accepted.

Miscellaneous items as provided by the Contract Documents:

b. End Anchorage Assemblies:

- 1) The quantity to be paid for will be the number of each type constructed, in place and accepted.

c. Special Guardrail Posts:

- 1) The quantity to be paid for will be the number of each, constructed, in place and accepted.
- 2) The designation "Special Guardrail Posts" will include only such posts as require special fabrication, for installation at locations where the normal setting would conflict with concrete structures, such as approach slabs, culvert slabs, footings, inlets, etc. Special posts, however, will not include posts for double-face median guardrail, regardless of whether they are embedded in or attached to concrete.

d. Bridge Anchorage Assemblies:

- 1) The quantity to be paid for will be the number of each, constructed, in place and accepted.

e. Guardrail Anchorage (Concrete Barrier Wall):

- 1) The quantity to be paid for will be the number of each, constructed, in place and accepted.

f. Guardrail Post Replacement:

- 1) The quantity to be paid for will be the number of each, replaced.

g. Removal of Existing Guardrail:

- 1) The quantity to be paid for will be the length, in feet, measured prior to removal.

h. Special Steel Guardrail Posts:

- 1) The quantity to be paid for will be the number of each, constructed, in place and accepted.

G. Basis of Payment.

Guardrail:

- a. Price and payment will be full compensation for all work specified under this Article, including the furnishing and installing of the acrylic plastic reflectors and all other materials as specified. Payment will be made under the items as follows:
 - 1) Where the Contractor furnishes all materials for the guardrail, and the Engineer does not require shop-bent rails, payment will be made under the basic item of Guardrail.
 - 2) Where the radius of the guardrail installation is such as to require shop bending of the guardrail panels, payment will be made under the item of Guardrail (Shop-bent Panels).
- b. All component parts of the complete guardrail installation will be included in the price per foot for the above items except, when the Contract Documents provides for the separate payments to be made under the special items listed below.
 - 1) End Anchorage Assemblies:
 - a) Price and payment will include all components specified in the Contract Documents and FDOT Design Standards.
 - 2) Special Guardrail Posts:
 - a) Price and payment will include all costs for furnishing and installing the special posts that are over and above the costs for the normal posts, which are replaced by such special posts.
 - 3) Bridge Anchorage Assemblies:
 - a) When the Contract Documents provide for direct payment for Bridge Anchorage Assemblies, price and payment will include furnishing and installing the special End Shoes, Wood Blocks or Retrofit Wing Posts, Concrete Anchor Posts and necessary hardware.
 - b) When the Contract Documents do not provide for direct payment for Bridge Anchorage Assemblies, the Contractor shall include the cost for the assemblies in the Contract price per foot for the guardrail.
 - 4) Guardrail Anchorage (Concrete Barrier Wall):
 - a) Price and payment will include installing connections to concrete barrier walls, as shown on the FDOT Design Standards, Index Nos. 400 and 410.
 - 5) Guardrail Post Replacement:
 - a) Price and payment will include all labor, materials, and equipment required for removal and disposal of existing posts in areas provided by the Contractor, backfilling and compacting existing holes, and replacement with new posts.
 - 6) Removal of Existing Guardrail:
 - a) Price and payment will include all labor and equipment required for removal and disposition

of the existing guardrail, as specified in the Contract Documents. No additional payment will be made for the removal of the back rail on double face guardrail, three beam guardrail, nested rail, safety pipe rail, rub rail or end anchorages.

7) Special Steel Guardrail Posts with Accessories:

- a) Price and payment will include all components specified in the Contract Documents and the FDOT Design Standards.

No separate pay item(s) for Guardrail will be provided under this contract.

538 RESETTING GUARDRAIL

A. Description.

Remove the existing guardrail, and reset the salvaged guardrail with new materials. Reset the guardrail, at locations shown in the Plans or designated by the Engineer, in accordance with the FDOT design standards for guardrail construction, as modified by the Contract Documents.

B. Materials.

Prevent damage to reusable materials when removing existing guardrail.

Furnish all new materials necessary to complete the reset guardrail installation.

Provide only new offset blocks.

Meet the requirements specified in the Contract Documents for Guardrail.

C. Construction Methods.

Set posts in accordance with the requirements of the Contract Documents.

Erect guardrail panels, anchors, and hardware in accordance with the FDOT design standards for guardrail construction, as modified by the Contract Documents.

Replace any salvageable materials damaged by operations at no expense to the Department.

Use a consistent type of post throughout a run of guardrail.

D. Method of Measurement.

The quantities to be paid for will be as measured and accepted by the Engineer in feet of reset guardrail.

Additionally and where provided by the Contract Documents, the quantities of the following items to be paid for will be as measured and accepted by the Engineer:

- a. number of end anchorage assemblies of each type as designated,
- b. number of special posts, and
- c. number of bridge anchorage assemblies.

E. Basis of Payment.

Prices and payments for resetting guardrail will be full compensation for all work specified in this Article, including furnishing all required new hardware and posts, all new offset blocks, and replacement of any material damaged by the Contractor except as specified below.

Price and payment for end anchorage assemblies, special guardrail posts, and bridge anchorage assemblies will be as specified in the Contract Documents for Guardrail.

Payment for new guardrail panels furnished to replace such items determined to be non-salvageable, excluding any items damaged by the Contractor, will be paid for at the actual invoiced cost for the panels including transportation charges, to which cost will be added an amount equal to 25% of the total invoice amount.

No separate pay item(s) for Resetting Guardrail will be provided under this contract

546 RUMBLE STRIPS (REV. 08-02-2022)

A. Description

1. Construct rumble strips in accordance with the details shown in the Plans and FDOT Standard Plans, Index 546-001.

B. Materials for Raised Rumble Strips

1. Permanent Raised Rumble Strips: Construct permanent raised rumble strips using one of the following:
 - a. Preformed Thermoplastic: Use only materials listed on the FDOT's Approved Product List (APL), meeting the following requirements:
 - 1) Preformed Thermoplastic from FDOT Standard Specifications 971-1 and 971-6. Ensure that the material used can be restored to its original dimensions by using a self-bonding overlay meeting these requirements.
 - b. Asphalt: Any plant-mixed hot bituminous asphalt mixture meeting the requirements of a job-mix formula issued by FDOT, except open-graded friction course.
 - c. Short-Term Raised Rumble Strips: Construct short-term raised rumble strips meeting the requirements of this Article, or by using removable polymer striping tape meeting FDOT requirements of 990-9.

C. Application:

1. Permanent Raised Rumble Strips:
 - a. Notify the Engineer before the placement of raised rumble strips. Apply raised rumble strips having well defined edges. Remove and replace any raised rumble strips not meeting the requirements of the Contract Documents at no additional cost to the Department.
 - b. Before applying raised rumble strips, remove any material that would adversely affect the bond of the

raised rumble strips by a method approved by the Engineer.

- c. Apply raised rumble strips only to dry surfaces, and only when the ambient air and surface temperature is at least 55°F and rising.
- d. Before applying thermoplastic materials on portland cement concrete surfaces, apply a primer sealer recommended by the manufacturer.
- e. Prior to the application of any plant-mixed hot bituminous material, apply a tack coat meeting the requirements of FDOT Section 300, Prime and Tack Coats.
- f. The mixture will be accepted on the basis of visual inspection by the Engineer with no further testing required.

2. Short-Term Raised Rumble Strips:

- a. Install short-term raised rumble strips before opening to traffic, and in accordance with this Article. Maintain and remove short-term raised rumble strips until permanent raised rumble strips are installed.

3. Ground-In Rumble Strip:

a. General:

- 1) Grind rumble strips that have well-defined edges and smooth interiors without tearing the finished pavement.
- 2) On a daily basis, before opening the adjacent lane to traffic, ensure that all debris generated by the grinding process is removed and disposed of by vacuum or a method approved by the Engineer. Do not dispose of the debris within the right of way. Do not use the debris generated by the grinding process in recycled asphalt (RAP).
- 3) Restore any pavement to the satisfaction of the Engineer, at no additional cost to the Department, when ground-in rumble strips do not meet the requirements of the Contract Documents.

4. Inspections:

- a. For limited access roadways, measure depth every one mile. For arterial and collector roadways, measure depth every 500 feet. Measure depth as distance from pavement grade to top of ground-in grooves at the transverse and longitudinal centerline of the grinding prior to the placement of longitudinal thermoplastic pavement markings. Measure, record, certify and submit to the Engineer.

D. Method of Measurement.

1. The quantity of raised rumble strip sets to be paid for under this Section will be the quantity per each, constructed and accepted.
2. The quantity of ground-in rumble strips to be paid for under this Section will be the quantity in gross miles, constructed and accepted. No deduction will be made when the skip array is used

E. Basis of Payment.

1. Price and payment will be full compensation for all work specified in this Section, including all surface cleaning and preparation, all debris disposal, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines, labor, and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

No separate pay item(s) for Resetting Guardrail will be provided under this contract

575 SODDING

A. Description.

Establish a stand of grass within the specified areas, by furnishing and placing sod, and rolling, watering, and maintaining the sodded areas to ensure a healthy stand of grass.

B. Materials. Meet the following requirements:

Sod FDOT 981-2

Water FDOT Section 983

C. Construction Methods.

Preparation of Ground: Scarify or loosen the areas requiring sod to a depth of 6 inches. On areas where the soil is sufficiently loose, particularly on shoulders and fill slopes, the Engineer may authorize the elimination of the ground preparation. Limit preparation to those areas that can be sodded within 72 hours after preparation. Prior to sodding, thoroughly water areas and allow water to percolate into the soil. Allow surface moisture to dry before sodding to prevent a muddy soil condition.

Placing Sod: Place sod immediately after ground preparation. Do not use sod which has been cut for more than 72 hours. Stack all sod that is not planted within 24 hours after cutting and maintain proper moist condition.

- a. Do not sod when weather and soil conditions are unsuitable for proper results. Pre-wet the area prior to placing sod. Do not place sod on eroded or washed out sites.
- b. Place the sod on the prepared surface, with edges in close contact, and embed it firmly and smoothly by light tamping with appropriate tools.
- c. Place the sod to the edge of all the paving and shrub areas and 1 inch below adjoining pavement with an even surface and edge. Place rolled sod parallel with the roadway and cut any exposed netting even with the sod edge.
- d. Roll using a lightweight turf roller. Provide a true and even surface without any displacement of the sod or deformation.
- e. Where sodding in drainage ditches, stagger the setting of the sod pieces to avoid a continuous seam along the line of flow. Ensure that the offsets of individual strips do not exceed 6 inches. Tamp the outer pieces of sod to produce a featheredge effect.

- f. Peg sod at locations where the sod may slide. Drive pegs through sod blocks into firm earth, at intervals approved by the Engineer.

- g. Remove any sod as directed by the Engineer.

Watering: Thoroughly water the sod immediately after placing. Do not water in excess of 1 inch per week for establishment. The contractor shall water and maintain newly sodded areas as needed and adhere to the following minimum frequencies until final acceptance of the Project by the County unless otherwise approved by the Engineer:

h. Minimum Watering Schedule (3/4" to 1" per watering)

- 1) Every day for the first 14 days after placement, followed by
- 2) Three times per week for next 14 days, followed by
- 3) Two times per week until final acceptance of the project.

i. Mowing Schedule

- 1) Minimum bi-weekly after established, and
- 2) Immediately prior to final acceptance.

D. Maintenance.

Maintain the sodded areas in a satisfactory condition until final acceptance of the project. Include in such maintenance the filling, leveling, and repairing of any washed or eroded areas, as may be necessary. The Department will pay for resodding necessary due to factors determined by the Engineer to be beyond the control of the Contractor.

Monitor placed sod for growth of pest plants and noxious weeds. If pest plants and/or noxious weeds manifest themselves within 30 days of placement of the sod, treat affected areas by means acceptable to the Department at no expense to the Department. If pest plants and/or noxious weeds manifest themselves after 30 days from date of placement of sod, the Engineer, at his sole option, will determine if treatment is required and whether or not the Contractor will be compensated for such treatment. If compensation is provided, payment approved by the Engineer will be made as unforeseeable work.

Maintenance of sodded areas is required for no less than thirty (30) days after placement or until the sodded area is determined to be established and satisfactory by the Engineer, whichever is greater.

E. Method of Measurement.

The quantities to be paid for will be the area of sodding measured and accepted by the Engineer.

Measurement for payment shall include only areas of sodding that have established a satisfactory root system (i.e. leaf blades break before sod can be pulled from the soil by hand).

F. Basis of Payment.

Prices and payments for Sodding will be full compensation for all work, water, and materials required to perform the work as specified in this Article, the satisfactory disposal of excavated material, and the furnishing and application of the water.

The costs for watering, mowing, and maintaining the sod in a moist condition for a period of at least two weeks, shall be included in the Contract unit price for Sodding.

No separate pay item(s) for Sodding will be provided under this contract.

575 RELOCATION OF TREES OR PALMS; AND PROTECTION OF EXISTING LANDSCAPE

A. Relocation of trees or palms

General

- a. Work consists of relocating trees and/or palms within the existing right of way, within a one (1) mile radius, in locations indicated in the drawings or as directed by the Engineer. Where drainage work is required, minor adjustments to the system may be necessary to minimize relocations.
- b. The Contractor shall be cognizant of and comply with the Miami-Dade County Ordinance regulating the removal and/or relocation of all trees. Permits required for tree removal and/or relocation shall be the responsibility of the Contractor.

Material

- c. Water: provide water by a method approved by the Engineer meeting the requirements of FDOT Section 983.
- d. Backfill Material: the existing material excavated from the planting pit is to be used as backfill.

Pruning

e. Trees

- 1) Prior to root pruning, prune tree canopy to ISA Standards and conform to ANSI A300. The extent of pruning shall be the minimum needed to reduce shock resulting from severing of roots.
- 2) No more than 30 percent of total canopy branches greater than one inch in diameter may be removed. Interior sucker growth and dead wood shall be removed first, followed by selective pruning of branches and limbs. Limbs that run through the tree crown shall be removed before other limbs are removed. Pruning shall not destroy the form of the tree. All cuts shall be made outside of the branch collar.
- 3) Trees shall be root pruned six (6) weeks prior to relocation. No backhoes or trenchers shall be used in the process. Backfill trench within 24 hours after root pruning with coarse sand.
- 4) Where required by the Engineer or the designated County arborist, brace and guy the root pruned tree to support and maintain the tree in a stable vertical position until relocation.

CONST_SPEC_0718

Replanting

f. Trees

- 1) The planting pit shall be a minimum of 24" wider than the diameter of the rootball unless otherwise directed by the Engineer. The depth of the pit shall be adjusted so that the top of the rootball will be at the same elevation or slightly above the existing ground level. All plants shall be centered in the hole. Trees shall be watered in during the planting process to eliminate air pockets in the backfill.
- 2) Size of the trees will be the trunk diameter measured at breast height (54 inches above grade).
- 3) All trees are to be fertilized at the time of planting with Atlantic Florida East Coast Fertilizer Mixture (No. 5231) 12-06-08 slow-release fertilizer or approved equal. This fertilizer is to be spread evenly over the top of the planting pit after backfilling. The application rate is 2 lbs/tree.

g. Palms

- 1) The planting pit shall be a minimum of 24" wider than the diameter of the rootball unless otherwise directed by the Engineer. The depth of the pit shall be adjusted so that the top of the rootball will be at the same elevation or slightly above the existing ground level. All plants shall be centered in the hole. Burlap is to be untied and pulled away from the top of the ball, unless specified in writing by the Engineer. Plants are to be watered-in during the planting process to eliminate all air pockets in the backfill material.
- 2) Size of the palm will be determined by measuring ground level to the topmost portion of the palm.
- 3) All palms are to be fertilized at time of planting with Atlantic Florida East Coast Fertilizer Mixture 08-04-12 slow-release improved palm special fertilizer or equal. This fertilizer is to be spread evenly over the top of the planting pit after backfilling. The application rate of 3 lbs/palm.

Mulching:

- h. A planting saucer will be established, the same size as the diameter of the planting pit and the rim shall be no higher than 4 inches. The mulch is to be Forestry Research Products Florimulch (Melaleuca mulch) free of viable seed and burrowing nematodes and certified by the Florida Department of Agriculture, or equal, and is to be spread evenly inside the saucer to a depth of 3 inches.
- i. Remove saucer prior to Project completion or as directed by the Engineer.

Staking and Guying:

- j. This work shall be performed in accordance with the standard planting detail for trees and/or palms.
- k. Palms shall be staked using the Arborlock Staking System or equal (with the approval of County representative).

Specification

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- l. Trees shall be guyed using Arbor Tie (a flat woven polypropylene material with 900 lbs. Break strength) manufactured by Deep Root Partners, L.P., or equal.
- m. Six (6) month after planting, the Contractor shall return to the site and remove all materials used for staking and guying. At the discretion of the Engineer, the period for staking and guying may be extended beyond six (6) months but for no longer than one (1) year.

Watering Schedule:

- n. After replanting trees and palms, they are to be watered as follows:
 - 1) for the first 4 weeks 3 times/week
 - 2) for the second 4 weeks 2 times/week
 - 3) for the third 4 weeks 1 time/week
- o. Application Rate:
 - 1) Trees and slender trunk palms 6 gal/watering
 - 2) Moderate and heavy trunk palms 10 gal/watering

Guarantee of Relocated Trees and Palms

- p. All trees and palms that are relocated shall be guaranteed for a period of one year after relocation.

B. Protection of Existing Landscaping

Description:

- a. Install tree protection barricades when called for in the Contract Documents or by the Engineer to protect existing trees and landscape from damage during project construction. Place barricades, as directed by the Engineer, at the drip line of the landscape foliage or as far from the base of the tree trunk as possible. Barricades shall consist of Heavy-Duty Construction (Orange) Barrier Fence (Minimum 4-feet high) attached to 2-inch by 4-inch by 6-foot long vertical wooden posts per FDOT Index No. 544 except that 2-inch by 4-inch horizontal wooden top bars with a maximum 8-foot spacing between posts shall be used. Barricades shall be able to withstand bumps by heavy equipment and trucks. Maintain barricades in good condition.
- b. All trees, shrubbery, and landscaping (on the R/W or adjacent property) irreparably damaged or destroyed by the Contractor during construction, as determined by the Engineer, shall be replaced by and at the Contractor's expense. Trees and shrubbery shall be replaced with like-sized plants; except for trees or shrubs removed pursuant to the requirements of the Contract Documents or at the specific direction of the Engineer. Replacement plant size shall be determined by calculating the total diameter at breast height (DBH) of affected trees, palms, and/or shrubbery, or the total averaged height of affected trees, palms, and/or shrubs. All replacement material must be Florida #1 Grade or better.

C. Method of Measurement:

The quantity to be paid for relocation of trees or palms will be the quantities measured, completed and accepted by the

Engineer, under the items shown in the Contract Document.

The quantity to be paid for protection of existing landscape will be the quantity in linear feet of barricade, completed and accepted, measured by the Engineer.

D. Basis of Payment:

Price and payment shall be full compensation for all work specified in this Section inclusive of all labor, material, and equipment necessary for the proper relocation of trees or palms and protection of existing landscape as required by the Contract Documents.

No separate pay item(s) for Landscape Installation will be provided under this contract.

580 LANDSCAPE INSTALLATION

A. Description.

Plant trees and shrubs of the species, size, and quality indicated in the plans.

The Engineer reserves the right to adjust the number and location of any of the designated types and species to be used at any of the locations shown, in order to provide for any unanticipated effects which might become apparent after the substantial completion of other phases of the Project, or for other causes.

B. Materials.

Plants:

- a. Authority for Nomenclature; Species, etc.: For the designated authority in the identification of all plant material, refer to two publications of L.H. Bailey: "Hortus III" and "Manual of Cultivated Plants," and ensure that all specimens are true to type, name, etc., as described therein. For the standard nomenclature, refer to the publication of the American Joint Committee on Horticultural Nomenclature, "Standardized Plant Names."
- b. Grade Standards and Conformity with Type and Species: Only use nursery grown plant material except where specified as Collected Material. Use nursery grown plant material that complies with all required inspection, grading standards, and plant regulations in accordance with the latest edition of the Florida Department of Agriculture's "Grades and Standards for Nursery Plants".
 - 1) Except where a lesser grade might be specifically specified in the plans, ensure that the minimum grade for all trees and shrubs is Florida No. 1. Ensure that all plants are the proper size and grade at the time of delivery to the site, throughout the project construction period and during any designated plant establishment period.
 - 2) Ensure that plant materials are true to type and species and that any plant materials not specifically covered in Florida Department of Agriculture's

"Grades and Standards for Nursery Plants" conform in type and species with the standards and designations in general acceptance by Florida nurseries.

- 3) Ensure that plant materials are shipped with tags stating the botanical and common name of the plant.

- c. Inspection and Transporting: Move nursery stock in accordance with all Federal and State regulations and accompany each shipment with the required inspection certificates for filing with the Engineer.

Water: Water used in landscaping operations may be obtained from any approved source. Ensure that water is free of any substance which might be detrimental to plant growth. The use of effluent water is subject to approval and must meet all Federal, State and Local requirements.

C. Specific Requirements for the Various Plant Designations.

Balled-and-Burlapped Plants (B&B), and Wired Balled-and-Burlapped (WB & B):

- a. General: Properly protect the root ball of these plants until planting them. The Engineer may reject any plant which shows evidence of having been mishandled.
 - 1) Set the B&B and WB&B plants then remove the top 2/3 of all wire, rope, and binding surrounding the plant. Remove the burlap from the top 4 inches [100 mm] of the root ball. Do not disturb the root ball in any way. Bare root material is not allowed for substitution.
 - 2) At least 90 days before digging out B & B and WB & B plants, root-prune those 1 1/2 inches [38 mm] or greater in diameter and certify such fact on accompanying invoices.
- b. Provisions for Wiring: For plants grown in soil of a loose texture, which does not readily adhere to the root system (and especially in the case of large plants or trees), the Engineer may require WB & B plants. For WB & B plants, before removing the plant from the excavated hole, place sound hog wire around the burlapped ball, and loop and tension it until the tightened wire netting substantially packages the burlapped ball such as to prevent disturbing of the loose soil around the roots during handling.

Container-Grown Plants (CG): The Engineer will not accept any CG plants with roots which have become pot-bound or for which the top system is too large for the size of the container. Fully cut and open all containers in a manner that will not damage the root system. Do not remove CG plants from the container until immediately before planting to prevent damage to the root system.

Collected Plants (Trees and Shrubs) (C): Use C plants which have a root ball according to "Florida Grades and Standards for Nursery Plants". Do not plant any C plant before the Engineer's inspection and acceptance at the planting site.

Collected Plants (Herbaceous) (HC): The root mass and vegetative portions of collected herbaceous plants shall

be as large as the specified container-grown equivalent. Do not plant any collected plant before inspection and acceptance by the Engineer.

Specimen Plants (Special Grade): When Specimen (or Special Grade) plants are required, label them as such on the plant list, and tag the plant to be furnished.

Palms: Wrap the roots of all plants of the palm species before transporting, except if they are CG plants and ensure that they have an adequate root ball structure and mass for healthy transplantation as defined in "Florida Grades and Standards for Nursery Plants".

- c. The Engineer will not require burlapping if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.
- d. Move sabal and coconut palms in accordance with the "Florida Grades and Standards for Nursery Plants."

Substitution of Container-Grown (CG) Plants: With the Engineer's approval, the Contractor may substitute CG plants for any other root classification types, if he has met all other requirements of the Contract Documents.

D. Planting Requirements.

Layout: Prior to any excavation or planting, mark all planting beds and individual locations of palms, trees, large shrubs and proposed art and architectural structures, as shown in the plans, on the ground with a common bright orange colored spray paint, or with other approved methods, within the project limits. Obtain the Engineer's approval and make necessary utility clearance requests.

Excavation of Plant Holes: Excavate plant holes after an area around the plant three times the size of the root ball has been tilled to a depth of the root ball. Ensure that the plant hole is made in the center of the tilled area only to the depth of the plant root ball.

- a. Where excess material has been excavated from the plant hole, use the excavated material to backfill to proper level.

Setting of Plants: Center plants in the hole. Lower the plant into the hole so that it rests on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance.

- b. Backfill with native soil, unless otherwise specified on the plans. Firmly rod and water-in the backfill so that no air pockets remain. Apply a sufficient quantity of water immediately upon planting to thoroughly moisten all of the backfilled earth. Keep plants in a moistened condition for the duration of the planting period.
- c. When so directed, form a water ring 6 inches [150 mm] in width to make a water collecting basin with an inside diameter equal to the diameter of the excavated hole. Maintain the water ring in an acceptable condition.

Special Bed Preparation: Where multiple or mass plantings are to be made in extended bedding areas, and the plans specify Special Bed Preparation, prepare the planting beds as follows:

- d. Remove all vegetation from within the area of the planting bed and excavate the surface soil to a depth of 6 inches [150 mm]. Backfill the excavated area with peat, sand, finish soil layer material or other material to the elevation of the original surface. Till the entire area to provide a loose, friable mixture to a depth of at least 8 inches [200 mm]. Level the bed only slightly above the adjacent ground level. Then mulch the entire bedding area, in accordance with 580 8.

E. Staking and Guying.

General: When specified in the plans, or as directed by the Engineer, stake plants in accordance with the following.

- a. Use wide plastic, rubber or other flexible strapping materials to support the tree to stakes or ground anchors that will give as the tree moves in any direction up to 30 degrees. Do not use rope or wire through a hose. Use guy chords, hose or any other thin bracing or anchorage material which has a minimum 12 inches [300 mm] length of high visibility flagging tape secured to guys, midway between the tree and stakes for safety.
- b. Stake trees larger than 1 inch [25 mm] diameter and smaller than 2 inches [50 mm] diameter with a 2 by 2 inch [50 by 50 mm] stake, set at least 2 feet [0.6 m] in the ground and extending to the crown of the plant. Firmly fasten the plant to the stake with flexible strapping materials as noted above.

Trees of 2 to 3 1/2 inches [50 to 90 mm] Caliper: Stake all trees, other than palm trees, larger than 2 inches [50 mm] caliper and smaller than 3 1/2 inches [90 mm] caliper with two 2 by 4 inch [50 by 100 mm] stakes, 8 feet [2.4 m] long, set 2 feet [0.6 m] in the ground. Place the tree midway between the stakes and hold it firmly in place by flexible strapping materials as noted above.

Large Trees: Guy all trees, other than palm trees, larger than 3 1/2 inches [90 mm] caliper, from at least three points, with flexible strapping materials as noted above.

- c. Anchor flexible strapping to 2 by 4 by 24 inch [50 by 100 by 600 mm] stakes, driven into the ground such that the top of the stake is at least 3 inches [75 mm] below the finished ground.

Special Requirements for Palm Trees: Brace palms which are to be staked with three 2 by 4 inch [50 by 100 mm] wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2 by 4 by 12 inch [50 by 100 by 300 mm] stake pads.

F. Tree Protection and Root Barriers.

Install tree barricades when called for in the Contract Documents or by the Engineer to protect existing trees from damage during project construction. Place barricades at the drip line of the tree foliage or as far from

the base of the tree trunk as possible. Barricades shall be able to withstand bumps by heavy equipment and trucks. Maintain barricades in good condition.

When called for in the Contract Documents, install root barriers or fabrics in accordance with the details shown.

G. Pruning.

Prune all broken or damaged roots and limbs in accordance with established arboriculture practices. When pruning is completed ensure that all remaining wood is alive. Do not reduce the size or quality of the plant below the minimum specified.

H. Mulching.

Uniformly apply mulch material, consisting of wood chips (no Cypress Mulch is allowed), pine straw, compost, or other suitable material approved by the Engineer, to a minimum loose thickness of 3 inches [75 mm] over the entire area of the backfilled hole or bed within two days after the planting. Maintain the mulch continuously in place until the time of final inspection.

I. Disposal of Surplus Materials and Debris.

Dispose of surplus excavated material from plant holes by scattering or otherwise as might be directed so that it is not readily visible or conspicuous to the passing motorist or pedestrian. Remove all debris and other objectionable material from the site and clean up the entire area and leave it in neat condition.

J. Contractor's Responsibility for Condition of the Plantings.

Ensure that the plants are kept watered, that the staking and guying is kept adjusted as necessary, that all planting areas and beds are kept free of weeds and undesirable plant growth and that the plants are maintained so that they are healthy, vigorous, and undamaged at the time of acceptance.

K. Plant Establishment Period.

If the Contract Documents designate a Plant Establishment Period, assume responsibility for the proper maintenance, survival and condition of all landscape items during such period at no additional cost.

L. Method of Measurement.

The quantities to be paid for will be the items shown in the plans, completed and accepted.

M. Basis of Payment.

Prices and payments will be full compensation for all work specified in this Article.

Payment will be under:

Item No.	Description	Unit
580-01	LANDS CAP E (Includes tree planting and relocation, metal tree graes hedge shrubs, ground covers, mulch, planting soil, landscape stone, rice rock, weed guards vines gra ding, etc.)	LS

**600 GENERAL PROVISIONS FOR TRAFFIC CONTROL
DEVICES (REV. 04-14-15)**

- A. Please refer to Appendices to the Special Provisions for Traffic Signals and Signs Provisions and Specifications.

**701 AUDIBLE AND VIBRATORY PAVEMENT MARKINGS
(REV. 01-07-2014)**

A. Description

Apply audible and vibratory pavement markings in accordance with the Contract Documents.

B. Materials

Thermoplastic:

- a. Use thermoplastic material meeting the requirements of FDOT 971-1 and 971-9 and listed on the FDOT's Approved Product List (APL) as an approved system. The Engineer will take random samples of the materials in accordance with the FDOT's Sampling, Testing and Reporting Guide schedule.

Retroreflective Elements:

- b. Use reflective elements recommended by the manufacturer that meet the requirements of FDOT 971-1.7 and are part of the system listed on the APL.

C. Equipment

Use equipment capable of providing continuous, uniform heating of the striping material to temperatures exceeding 390°F, mixing and agitating the material in the reservoir to provide a homogenous mixture without segregation. Use equipment that will maintain the striping material in a plastic state, in all mixing and conveying parts, including the line dispensing device until applied. Use equipment which is capable of producing a consistent pattern of transverse bumps positioned at regular and predetermined intervals. Use equipment which meets the following requirements:

- a. Capable of traveling at a uniform rate of speed, both uphill and downhill, to produce a uniform application of striping material and capable of following straight lines and making normal curves in a true arc.
- b. Capable of applying reflective elements to the surface of the completed stripe by automatic dispensers attached to the striping machine such that the reflective elements are dispensed closely behind the installed line. Use reflective element dispensers equipped with an automatic cut-off control that is synchronized with the cut-off of the thermoplastic material and applies the reflective elements uniformly on the entire traffic stripe surface with 50 to 60% embedment.
- c. Equipped with a special kettle for uniformly heating and melting the striping material. The kettle must be equipped with an automatic temperature control device and material thermometer for positive temperature control and to prevent overheating or scorching of the thermoplastic material.
- d. Meets the requirements of the National Fire Protection Association (NFPA), State and Local authorities.

D. Application

General:

- a. Before applying traffic stripes and markings, remove any material that would adversely affect the bond of the traffic stripes by a method approved by the Engineer.
- b. Before applying traffic stripes to any portland cement surface, apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Offset longitudinal lines at least 2 inches from construction joints of portland cement concrete pavement.
- c. Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 50°F and rising for asphalt surfaces and 60°F and rising for concrete surface.
- d. Apply striping to the same tolerances in dimensions and in alignment specified in Article 710, Painted Pavement Markings, Subarticle D. When applying traffic stripes and marking over existing markings, ensure that no more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.
- e. Conduct field tests in accordance with FM 5-541. Take test readings representative of the striping performance. Remove and replace markings not meeting the requirements of this Section.

E. Thickness:

Apply flat base lines having a thickness of 0.100 to 0.150 inches, exclusive of the audible bumps, when measured above the pavement surface.

Measure, record and certify and submit to the Engineer, the thickness of white and yellow pavement markings in accordance with FM 5-541.

The Engineer will verify the thickness of the pavement markings in accordance with FM 5-541 within 30 days of receipt of the Contractor's certification.

F. Dimensions of Audible Bumps:

Apply the raised bumps with a profile such that the leading and trailing edges are sloped at a sufficient angle to create an audible and vibratory warning.

Bumps on shoulder and centerline markings shall be at least 0.45 inches at the highest point of the bump, above the pavement surface, including the base line. The height shall be measured after application of drop-on reflective elements. Bumps shall have a minimum baseline coverage dimension of 2.5 inches in both transverse and longitudinal directions. The bumps may have a drainage channel, the width of each drainage channel will not exceed 1/4 inch at the bottom of the channel. The longitudinal distance between bumps shall be approximately 30 inches.

G. Retroreflectivity:

Apply white and yellow audible and vibratory markings that will attain an initial retroreflectance of not less than 300 mcd/lx·m2 and not less than 250 mcd/lx·m2, respectively.

Measure, record, and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with FM 5-541.

H. Color:

Use pavement marking materials that meet the requirements of FDOT 971-1.

I. Reflective Elements:

Apply reflective elements to all markings at the rates determined by the manufacturer's recommendations as identified for the APL System.

J. Loss:

If more than 1% of the bumps or more than three consecutive bumps are missing or broken (less than half a bump remaining) within the first 45 days under traffic, replace all failed bumps at no expense to the Department. If more than 2% of the bumps fail within the first 45 days under traffic, the replacement period will extend an additional 45 days from the date all replacement bumps were installed. If, at the end of the additional 45 days, more the 2% of all bumps (initial and replacement) fail, replace all failed bumps at no expense to the Department. Measure, record, certify and submit to the Engineer, the loss of bumps.

K. Contractor's Responsibility for Notification.

Notify the Engineer prior to the placement of audible and vibratory markings. Furnish the Engineer with the manufacturer's name and batch numbers of the thermoplastic materials and reflective elements to be used. Ensure that the batch numbers appear on the thermoplastic materials and reflective elements packages.

L. Protection of Newly Applied Audible and Vibratory Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause.

M. Observation Period.

Longitudinal pavement markings are subject to a 180 day observation period under normal traffic. The observation period will begin with the satisfactory completion and acceptance of the pavement marking work.

The longitudinal pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The retroreflectivity shall meet the initial requirements of Subarticle G. The Department reserves the right to check the retroreflectivity any time prior to the end of the observation period.

Replace, at no expense to the Department, any longitudinal pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

N. Corrections for Deficiencies.

Correct all deficiencies by removal and reapplication of a one mile section centered around the deficiency at no cost to the Department.

O. Submittals.

Submittal Instructions:

- a. Prepare and submit a certification of quantities to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

P. Method of Measurement.

The quantities to be paid for under this Section will be as follows:

- a. The length, in net miles, of 6 inches solid traffic stripe, authorized and acceptably applied.
- b. The total traversed distance in gross miles of 10-30 skip line. The actual applied line is 25% of the traverse distance for a 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.

Q. Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

No separate pay item(s) for Audible and Vibratory Pavement Markings will be provided under this contract.

705 OBJECT MARKERS AND DELINEATORS (REV. 08-23-12)

A. Description.

Furnish and install object markers to mark obstructions within or adjacent to the roadway of the types and at the locations called for in the Contract Documents.

Furnish and install delineators along the side of the roadway to indicate the alignment of the roadway as indicated in the Contract Documents.

Meet all requirements of the FDOT Design Standards and the Contract Documents.

B. Materials.

General:

- a. Meet the following requirements:

Object Markers and Delineators	FDOT Section 993
Retroreflective and Nonreflective Sign Sheetting	FDOT Section 994

Product Acceptance on the Project:

- b. Ensure that delineators, delineator posts, and markers used to delineate guardrail and barrier wall are listed on the FDOT Qualified Products List.
- c. Provide to the Engineer a manufacturer's certification conforming to the requirements of Article 1.04 (Controlling Materials) of Division 1, which confirms that each product meets the requirements of this Article.

C. Installation Requirements.

Install delineators, object markers, and reflector units for guardrail and barrier wall and in accordance with the MUTCD, FDOT Design Standards and Contract Documents.

D. Method of Measurement.

The quantity to be paid for will be the number of delineators or object markers furnished, installed and accepted.

E. Basis of Payment.

Prices and payments will be full compensation for work specified in this Article, including the cost of labor, materials, and incidental items required to complete the work.

No separate pay item(s) for Object Markers and Delineators will be provided under this contract.

706 RAISED RETRO-REFLECTIVE PAVEMENT MARKERS AND BITUMINOUS ADHESIVE (REV. 05-02-12)

A. Description.

Place raised Retro-Reflective Pavement Markers (RPMs) and adhesive, which upon installation produces a positive guidance system to supplement other reflective pavement markings.

B. Materials.

Use only Class B markers unless otherwise shown on the Plans.

Meet the requirements of FDOT Section 970.

Product Acceptance on the Project.

- a. Use only reflective pavement markers and bituminous adhesive that are listed on the FDOT Qualified Products List.
- b. Provide Engineer a producer's certification, conforming to the requirements of Article 1.04 (Controlling Materials) of the General Requirements to these

Specifications, which confirms that each product meets the requirements of this Article.

C. Equipment.

Use equipment having either thermostatically controlled double boiler type units utilizing heat transfer oil or thermostatically controlled electric heating pots to install hot applied bituminous adhesive. Do not use direct flame melting units with flexible adhesives; however, this type of unit may be used with standard adhesive in accordance with manufacturer's recommendations. Use a melter/applicator unit suited for both melting and pumping the adhesive through heated applicator hoses.

Heat the adhesive to between 375 and 425°F and apply directly to the bonding surface from the melter/applicator by either pumping or pouring. Maintain the application temperature between 375 and 425°F. The adhesive may be reheated. Do not exceed the manufacturer's recommendations for pot life at application temperatures.

D. Application.

Apply RPMs to the bonding surface using bituminous adhesives only. Engineer will conduct field testing in accordance with Florida Method (FM) 5-566. Correct RPMs not applied in accordance with these requirements at no cost to the Department.

Prior to application of adhesive, clean the bonding surface to remove any material that would adversely affect the adhesive.

Apply the adhesive to the bonding surface, not the RPMs, so that 100% of the bonding area of the RPMs will be covered, in accordance with adhesive manufacturer's recommendations. Apply sufficient adhesive to ensure, that when the RPMs are pressed downward into the adhesive, adhesive will be forced out around the entire perimeter of each RPM.

Immediately remove excess adhesive from the bonding surface and exposed surfaces of the RPMs. Soft rags moistened with mineral spirits meeting Federal Specifications TT-T-291 or kerosene may be used to remove adhesive from exposed faces of the RPMs. Do not use any other solvent. If any adhesive, pavement marking materials or other foreign matter adheres to the reflective face of the RPM, replace the RPM at no cost to the Department.

Install RPMs with the reflective face of the RPM perpendicular to a line parallel to the roadway centerline. Do not install RPMs over longitudinal or transverse joints of the bonding surface.

Ensure that all final RPMs are in place prior to opening the road to traffic.

If more than 2 percent of the RPMs fail in adhesion or alignment within the first 45 days under traffic, replace all failed RPMs at no expense to the Department. If more than 5 percent of the RPMs fail in adhesion and or alignment during the initial 45 day period, Engineer will extend the replacement period an additional 45 days from the date that all replacement RPMs have been installed. If, at the end of the additional 45 day period, more than 2

percent of all RPMs (initial installation and 45 day replacements combined) fail in adhesion or alignment, replace all failed RPMs at no expense to the Department.

E. Contractor's Responsibility for Notification.

Notify Engineer prior to the placement of RPMs. At the time of notification, indicate the manufacturer and the LOT numbers of RPMs and bituminous adhesive that are intended for use. Verify that the approved LOT numbers appear on the material packages. Furnish a test report to Engineer certifying that the materials meet all requirements specified.

F. Method of Measurement.

Unless otherwise specified herein, the quantities to be paid for will be the number of RPMs, furnished and installed, completed and accepted.

G. Basis of Payment.

Lump Sum Payment: When the pay item for Painted Pavement Markings (Final Surface) is included in the Contract, price and payment for RPMs is as stipulated in Article 710 of these Specifications. RPMs will not be measured or paid for separately.

Payment will be made under the item(s) below if provided in the Contract with awarded Contract unit price(s) for the completed quantities, measured and accepted by Engineer. Price and payment will be full compensation for all work specified in this Article.

No separate pay item(s) for Raised Retro-Reflective Pavement Markers and Bituminous Adhesive will be provided under this contract.

710 PAINTED PAVEMENT MARKINGS (REV. 05-02-12)

A. Description.

Apply Painted Traffic Stripes and Raised Retro-Reflective Pavement Markers (RPMs), in accordance with the Contract Documents.

B. Materials.

Use only materials listed on the FDOT Qualified Products List (QPL) meeting the following requirements:

Raised Retro-reflective Pavement Markers and Bituminous Adhesive	FDOT Section 970
Standard Waterborne Fast Dry Traffic Paint	FDOT 971-1 and 971-3
Fast Dry Solvent Paint	FDOT 971-1 and 971-4
Glass Spheres	FDOT 971-1 and 971-2

C. Equipment.

Use equipment that will produce continuous uniform dimensions of pavement markings of varying widths and meet the following requirements:

- Capable of traveling at a uniform, predetermined rate of speed, both uphill and downhill, in order to produce a uniform application of paint and capable of following straight lines and making normal curves in a true arc.
- Capable of applying glass spheres to the surface of the completed stripe by an automatic sphere dispenser attached to the striping machine such that the glass spheres are dispensed closely behind the installed line. Use a glass spheres dispenser equipped with an automatic cut-off control that is synchronized with the cut-off of the traffic paint and applies the glass spheres in a manner such that the spheres appear uniform on the entire pavement markings surface with 50 to 60 percent embedment.
- Capable of spraying the paint to the required thickness and width without thinning of the paint.

Paint tank must be equipped with nozzles having cut-off valves, which will apply broken or skip lines automatically.

D. Application:

General:

- Remove, by a method approved by Engineer, existing pavement markings such that scars or traces of removed markings will not conflict with new stripes and markings. Refer to Subarticle J below for Removal of Existing Painted Traffic Stripes and Markings Clean and dispose at an approved site all resulting debris. Use of paint to cover conflicting pavement markings is prohibited. Cost for removal of pavement markings is incidental to the work specified in this Article and will not be measured separately for payment. Cost for removing conflicting pavement markings during maintenance of traffic operations is included in general costs for Maintenance of Traffic.
- Before applying traffic stripes and markings, remove any material that would adversely affect the bond of the traffic stripes by a method approved by Engineer and consistent with manufacturer's specifications.
- Remove any vegetation, soil, and other materials covering the pavement where the marking is to be applied.
- Apply traffic stripes and markings only to dry surfaces, and when the ambient air and surface temperature is at least 40°F and rising. Do not apply traffic stripes and markings when winds are sufficient to cause spray dust.
- Apply traffic stripes and markings, having well defined edges, over existing pavement markings such that not more than 2 inches on either end and not more than 1 inch on either side is visible.
- Mix the paint thoroughly prior to pouring into the painting machine. Apply paint to the pavement by spray or other means approved by Engineer.
- Conduct field testing in accordance with Florida Method (FM) 5-541. Remove and replace traffic stripes and markings not meeting the requirements of this Article at no additional cost to the Department.

- h. Apply all pavement markings prior to opening the road to traffic.
- i. Apply all retro-reflective pavement markers per the requirements of Article 706 (Raised Retro-Reflective Pavement Markers and Bituminous Adhesive).

Painted Pavement Markings (Final Surface), when included as a single lumps sum item in the Contract having and awarded Contract price, will include two applications of standard painted pavement markings and one application of retro-reflective pavement markers applied to the final surface. Wait at least 14 days after the first application to apply the second application of Painted Pavement Markings (Final Surface). Second application must be applied prior to final acceptance of the project.

Thickness: Apply paint to attain a minimum wet film thickness in accordance with the manufacturer's recommendations.

Retroreflectivity:

- j. Apply white and yellow standard pavement markings that will attain an initial retroreflectance of not less than 300 mcd/lx•m² and not less than 250 mcd/lx•m², respectively. Measure, record and certify on a Department approved form and submit to Engineer, the retroreflectivity of white and yellow pavement markings in accordance with FM 5-541.
- k. The Department reserves the right to test the markings within 3 days of receipt of the Contractor's certification. Failure to afford the Department opportunity to test the markings will result in non-payment. The test readings should be representative of the Contractor's striping performance. If the retroreflectivity values measure below values shown above, reapply the pavement markings at no additional cost to the Department.
- l. For standard pavement markings, ensure that the minimum retroreflectance of white and yellow pavement markings are not less than 150 mcd/lx m². If the retroreflectivity values fall below the 150 mcd/lx m² value within six months of initial application, the striping will be reapplied at the Contractor's expense.

Color: Use paint material that meets the requirements of FDOT 971-1.

Glass Spheres: Apply glass spheres on all pavement markings immediately and uniformly following the paint application. The rate of application shall be based on the manufacturer's recommendation.

E. Tolerances in Dimensions and in Alignment.

Establish tack points at appropriate intervals for use in aligning stripes, and set a stringline from such points to achieve accuracy.

Dimensions:

- a. Longitudinal Lines: Apply painted skip line segments with no more than ±12 inches variance, so that over-tolerance and under-tolerance lengths between skip line and the gap will approximately balance. Apply longitudinal lines at least 2 inches from construction joints of Portland cement concrete pavement.
- b. Transverse Markings, Gore Markings, Arrows, and Messages: Apply paint in multiple passes when the

marking cannot be completed in one pass, with an overall line width allowable tolerance of ±1 inch

- c. Contrast Lines: Use black paint to provide contrast on concrete or light asphalt pavement, when specified by Engineer. Apply black paint in 10 foot segments following each longitudinal skip line.

Alignment:

- d. Apply painted stripes that will not deviate more than 1 inch from the stringline on tangents and curves one degree or less.
- e. Apply painted stripes that will not deviate more than 2 inches from the stringline on curves greater than one degree.
- f. Apply painted edge stripes uniformly, not less than 2 inches or more than 4 inches from the edge of pavement, without noticeable breaks or deviations in alignment or width.
- g. Remove and replace at no additional cost to the Department, traffic stripes that deviate more than the above stated requirements.

Correction Rates: Make corrections of variations in width at a maximum rate of 10 feet for each 0.5 inches of correction. Make corrections of variations in alignment at a maximum rate of 25 feet for each 1 inch of correction, to return to the stringline.

F. Contractor's Responsibility for Notification.

Notify Engineer prior to the placement of the materials. Furnish Engineer with the manufacturer's name and batch numbers of the materials and glass spheres to be used. Ensure that the approved batch numbers appear on the materials and glass spheres packages.

G. Protection of Newly Painted Pavement Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry.

Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

H. Corrections for Deficiencies to Applied Painted Pavement Markings.

Reapply a 1.0 mile section centered around any deficiency, at no additional cost to the Department.

I. Submittals.

Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for each project in the Contract. Submit the certification of quantities and daily worksheets to Engineer. The Department will not pay for any disputed items until Engineer approves the certification of quantities.

Contractor's Certification of Quantities: Request payment by providing to Engineer a monthly certification of quantities with each payment requisition or as directed by Engineer,

based on the amount of work done or completed. Ensure the certification of quantities include the following:

- a. Contract Number, Certification Number, Certification Date and the period that the certification represents.
- b. The basis for arriving at the amount of the progress certification, less payments previously made and less any amount previously retained or withheld. The basis will include a detailed breakdown provided on the certification of items of payment.

J. Removal of Existing Painted Traffic Stripes and Markings.

Removal Requirements.

- a. Remove existing pavement markings by water blasting, sandblasting, or other method approved by the Engineer. Do not use chemicals for the removal of painted traffic stripes and/or markings. Provide positive means to control dust and accumulation of debris from the removal operations. Remove all pavement marking materials from the pavement surface. Remove accumulated piles of any debris as a result of the removal operation from the right of way and dispose of in accordance with applicable Federal, State, and Local regulations, at no additional cost to the Department.

Protection of Existing Pavement Surfaces.

Conduct removal operations in a manner that will not damage existing pavement surfaces (concrete or asphalt) or damage pavement joint materials. Repair, to the satisfaction of the Engineer, any damage as a result of the removal operations.

Do not paint over existing pavement markings to blackout, hide, or disguise markings.

K. Method of Measurement.

The quantities to be paid for under this Article will be as follows:

- a. Length, in net miles, of 6 inch Solid Traffic Stripe, authorized and acceptably applied.
- b. Total traversed distance in gross miles of 10-30 or 3-9 skip line. The actual applied line is 25 percent of the traverse distance for a 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.
- c. Net length, in feet, of each of all other types of lines and stripes, authorized and acceptably applied.
- d. Number of pavement messages, symbols and directional arrows, authorized and acceptably applied. For bicycle marking, the bicycle symbol and the arrow will be paid as one unit.
- e. Lump Sum, as specified under Final Surface above, when the item for Painted Pavement Markings (Final Surface) is provided in the Contract with an awarded Contract Unit Price.

The net length, in feet of dotted and skip stripes other than 10-30 and 3-9 will be measured as the distance from the beginning of the first painted stripe to the end of the last painted stripe with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to the requirements of Subarticle 1.07 F.3

(Determination of Pay Areas) of the General Requirements to these Specifications. Unpainted intervals will not be included in pay quantity.

The gross-mile measurement of 10-30 and 3-9 Skip Traffic Stripes will be taken as the distance from the beginning of the first painted stripe to the end of the last painted stripe, and will include the unpainted intervals. It will not include any lengths of unpainted intervals which, by design or by other intent of the Department, are greater than 30 feet. Final measurement will be determined by plan dimensions or stations, subject to the requirements of Subarticle 1.07 F.3 of the General Requirements to these Specifications.

Removal:

- f. The area, in square feet, for removal of existing markings acceptably removed.
- g. Payment for removal of conflicting markings will be in accordance with 102-E.8. Payment for removal of non-conflicting markings will be paid separately.
- h. The gross mile measurement will be taken as the distance from the beginning of the painted line to the end of the painted line and will include the unmarked gaps for skip and dotted lines.
- i. The gross mile measurement will not include designated unmarked lengths at intersections, turn lanes, etc.

L. Basis of Payment.

General:

- a. Prices and payments will be full compensation for all work specified in this Article, including all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. There will be no separate payment for removal of conflicting markings.
- b. Final payment will be withheld until all deficiencies are corrected.

Lump Sum Payment: When the item for Painted Pavement Markings (Final Surface) is included in the proposal, prices and payments will be full compensation for two applications of all painted pavement markings applied to the final surface, and one application of retro-reflective pavement markers applied to the final surface in accordance Article 706 of these Specifications.

No separate pay item(s) Painted Pavement will be provided under this contract.

SECTION 7: SPECIAL PROVISIONS

SPECIAL PROVISIONS

SPECIAL PROVISIONS

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APPENDIX "A" TO SPECIAL PROVISIONS

Authorization Agreement for Automatic Deposit

APPENDIX "B" TO SPECIAL PROVISIONS

Additional Documents

1. Comfort Station 2 Specs
2. Geotechnical Engineering Report
3. Domestic Wastewater Collection
4. Map of Topographic Survey

1. GENERAL REQUIREMENTS

1.01 MISCELLANEOUS CONSTRUCTION CONTRACTS (MCC) PLAN. GENERAL TERMS AND CONDITIONS AND SPECIAL CONDITIONS

- A. Division 01 (General Requirements) of the DTPW Specifications amends the MCC Plan, and other provisions of the Contract Documents. All requirements of the MCC Plan, Resolution and amendments', or portions thereof, which are not specifically modified, deleted, or superseded by Division 01, remain in full effect. In the event a conflict between these two complementary portions of the Contract Documents occurs, Division 01 will prevail and Engineer will provide a clarification and final determination. These Special Provisions also amend, complement, modify or delete items from the DTPW Construction Specifications of these Solicitation and Contract Documents.

1.02 SCOPE OF WORK

- A. Work under this Contract includes but is not limited to the furnishing of all supervision, labor, materials, tools, equipment and performing all operations required to connect the public sanitary sewer system nearby, with a new sewer pump station, force main extension, to replace a septic system (septic tank and approximately 1,368 square feet of drain field) in accordance with Miami Dade County Public Works Manual and the conditions of the Miami-Dade County Miscellaneous Construction Contract, (MCC) Plan 7360. Work includes but is not limited to:
 - 1. The contractor is responsible to secure all necessary permits including but not limited to submittal of inspections, assessments if required by MDWASD, RER and DOH, shop drawings and permits applications. Contractor will only be reimbursed fees paid to permitting agencies at invoice cost from and dedicated allowance account. All other cost incurred while processing permits are to be added to the Lumps Sum price of the submittal.
 - 2. Remove and proper dispose of existing septic tank, drain field system, including pumping out existing waste and debris.
 - 3. Construct sewer pump station and appurtenances, sewer lateral and sewer force mains in accordance with MDWASD, RER and County Health Department and any other regulatory agency or municipality.
 - 4. Inspect effluent sewer pipe and replace if needed.
 - 5. Harmonize site including replacing and or re-working of revetment rocks, pavers, sod, small plants and or shrubbery to match existing surrounding area.
 - 6. Repair/Replace curbs, sidewalks, pavers, asphalt paths, pavement markings damaged or removed during construction.
- B. If any changes are required due to conflict of design and or field conditions, the Engineer will make the final determination.

1.03 LOCATION OF WORK

1. Work is located at 3095 Rickenbacker Causeway, Miami, Florida 33149
2. Contractor is responsible for obtaining all permits that may be required from them and meeting all requirements of the Owner.

1.04 TIME FOR COMPLETION

- A. The Work must be substantially completed within 365 days after the date when the Contract Time commences to run as provided in subarticle 1.06 N of the General Requirements (Division 1), and all requirements of the Contract Documents completed and ready for final payment within 305 days after the date when the Contract Time commences to run.
- B. The effective date of the "Notice to Proceed" will be established during the Preconstruction Conference which is held shortly after the Award of Contract and which is attended by members of Department of Transportation and Public Works, the Contractor, representatives of utility companies, and others affected by the Work. The effective date shall be set as a date no later than 30 calendar days after the date of execution of the Contract Documents unless a later date acceptable to both parties is agreed upon in writing.

WORK PERFORMED:

- A. Monday thru Friday from 7:00 a.m. to 4:00 p.m., additional times and weekends can be arranged with the DTPW project manager to expedite the installation. All work must be scheduled with DTPW personnel. The contractor may be required when using crane services to operate after hours and on weekends and will be included as part of this bid.

1.05 LIQUIDATED DAMAGES

- A. Delete Sub-Article 1.06, J from the DTPW, Liquidated Damages, from the General Requirements and replace as follows:

Contractor, or in case of his default the surety, shall pay to the County, not as a penalty but as liquidated damages, the amount stipulated below should Contractor fail to complete all work specified within the time stipulated in the Contract for substantial completion, including extra time granted in writing by the County.

Liquidated Damages shall be assessed in the amount of \$ 1,685,00, per day for each day of delay, not as a penalty, but as Liquidated Damages for each day or fraction thereof of delay until the Final Completion Date is met, which will be paid to Miami-Dade County by the Contractor.

Engineers will count default days in calendar days.

County has the right to apply, as payment on such liquidated damages, any money the County owes Contractor.

County does not waive its right to liquidated damages due under the Contract by allowing Contractor to continue and to finish the work, or any part of it, after the expiration of the Contract/Work Order Time including granted time extensions.

The requirements of this Article may not be waived, compromised or settled without the express written consent of the Director or his designee.

APPENDIX "A" TO SPECIAL PROVISIONS
AUTHORIZATION AGREEMENT FOR AUTOMATIC DEPOSIT



ACH AUTHORIZATION AGREEMENT FOR AUTOMATIC DIRECT DEPOSIT OF MIAMI-DADE COUNTY WARRANTS

We hereby authorize the Finance Department to initiate credit entries and, if necessary, a debit entry in order to reverse a credit entry made in error in accordance with NACHA rules.

Original form must be received before we can process your request for ACH deposits. Please refer to page 2 for instructions. Processing of the form is approximately 15 days from receipt of completed original form. This authority is to remain in effect until revoked in writing and received by the Finance Department. Account changes must be reported at a minimum **fifteen (15) days prior to actual change**.

Section 1 (TO BE COMPLETED BY VENDOR) - ALL FIELDS ARE REQUIRED

TRANSACTION TYPE:

New ☐

Change ☐

Terminate ☐

FEDERAL IDENTIFICATION NUMBER

(AS PER CURRENT W-9)

(FOR INTERNAL USE ONLY)

VENDOR NAME :

DBA (DOING BUSINESS AS) :

TELEPHONE NUMBER :

FISCAL OFFICER NAME AND TITLE :

FISCAL OFFICER'S EMAIL :

ACH NOTIFICATION EMAIL:

(This is the email where payment information will be sent)

ROUTING NUMBER

(FOR INTERNAL USE ONLY)

VENDOR'S BANK ACCOUNT NUMBER

TYPE OF ACCOUNT

Checking ☐

Savings ☐

AUTHORIZED SIGNATURE

DATE :

PRINTED NAME

A VOIDED CHECK OR REDACTED COPY OF A BANK STATEMENT FOR THE ACCOUNT LISTED ABOVE MUST BE PROVIDED. PLEASE REFER TO INSTRUCTIONS FOR OUR MAILING ADDRESS. SUBMISSION OF YOUR E-MAIL ADDRESS IS MANDATORY IN ORDER TO PARTICIPATE IN THIS PAYMENT OPTION.

Section 2 (TO BE COMPLETED BY FINANCIAL INSTITUTION)

FINANCIAL INSTITUTION NAME:

ADDRESS:

BANK OFFICIAL NAME (PRINTED) AND TITLE :

TELEPHONE NUMBER :

EMPLOYEE ID NO. :

EMAIL :

☐ I have verified that the account and routing number provided above is correct and corresponds to vendor noted above.

☐ I have also verified that the person signing is an authorized signer on the account specified.

SIGNATURE

DATE :

Section 3 (TO BE COMPLETED BY MIAMI-DADE FINANCE DEPARTMENT)

Accounts Payable Verifications

Corp. Officer Name :

Verified by:

A/P Staff:

Corp. Officer Title :

Date:

Bank Officer:

A/P Supervisor:

Date:

Cash Management

Routing # verified by :

Date:

Verified by :

Verification Date:

Input/Output

ACH Indicator updated by :

Date of Update :

Verified by :

Verification Date:



ACH AUTHORIZATION AGREEMENT FOR AUTOMATIC DIRECT DEPOSIT OF MIAMI-DADE COUNTY WARRANTS

INSTRUCTIONS

Please contact us at (305) 375-5111 or email at FIN-ACHN@miamidade.gov if you have any questions or need assistance with this form.

You may obtain blank copies of this form at : http://www.miamidade.gov/finance/library/ach_form.pdf

At our Vendor Payment Inquiry (VPI) website you can obtain payment information as well as status of invoices, payment due date and other important information. You can reach the VPI site at :

<https://w85exp.miamidade.gov/VInvoice/login.do>

Section 1

Transaction Type

- New : If vendor is currently not on ACH deposits with Miami-Dade County.
- Change : If vendor is currently on ACH deposits with Miami-Dade County and would like to make changes to their information (example : change of financial institution, account number, etc.)
- Terminate : If vendor is currently on ACH deposits with Miami-Dade County and would like to switch to either Check or AP Control disbursement type)

Federal Identification Number : Enter your Federal Employer Identification Number (FEIN) or Social Security Number (SSN) used to register you as a vendor with Miami-Dade County. Name and FEIN/SS must be exactly as provided on IRS Form W-9.

Vendor Name : Enter the name of your business or individual name used to register you as a vendor with Miami-Dade County.

DBA (Doing Business As) : If you have registered a DBA for your business or for you as an individual, please enter it here.

Fiscal Officer Name, Title and E-Mail : Name of Authorized Corporate officer, Title and E-Mail address to be contacted to. Corporate officer signing this form must be an authorized signatory in the corporate bank account listed on this form.

ACH Notification E-Mail : This is the E-Mail address where payment information will be sent to.

Section 2

This section must be completed in full and legible manner by your banking institution in order to prevent delays in processing change to ACH. Both acknowledgment statements must be checked off by Bank Official signing and dating the form.

Section 3

This section will be completed by Miami-Dade County Finance Department.

ORIGINAL FORM AND VOIDED CHECK OR REDACTED STATEMENT MUST BE MAILED TO :

Accounts Payable Manager

Miami-Dade County Finance Department

111 NW First Street, Suite 2620

Miami, Florida 33128

Terms and Conditions

Completed form should not contain any changes (scratched off /white out) or altered information; otherwise, form will not be accepted.

Processing time is approximately fifteen (15) days from receipt of complete form and voided check or redacted Bank statement.

Providing account information does not authorize Miami-Dade County to access bank account activity.

ACH deposits can be made into **only** one (1) bank account. Payments can not be split between multiple accounts.

Notification E-mail providing payment information can be sent to one (1) single E-mail address **only**.

Proper verification will be conducted by Miami-Dade County Finance Department Staff, via a telephone call to confirm the information being provided is accurate.

This authorization shall remain in effect until terminated in writing with sufficient notice to Miami-Dade County Finance Department.

Miami-Dade County will not be responsible for any loss that may arise solely by reason of error, mistake or fraud regarding information provided on this ACH Authorization Agreement Form.

Appendix “B” to the Special Provisions
ADDITIONAL DOCUMENTS

Comfort Station 2 Specifications

SECTION 01011**SITE CONDITIONS****PART 1 GENERAL****1.01 SITE INVESTIGATION AND REPRESENTATION**

- A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation; disposal, handling and storage of materials; availability of labor, water, electric power, roads; disposal of water from construction; uncertainties of weather; the conformation and conditions at the ground; the type of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract.
- B. The Contractor further acknowledges that he has satisfied himself as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site and from evaluating information derived from exploratory work that may have been done by WASD or included with these Contract Documents. Any failure by the Contractor to acquaint himself with all the available information will not relieve him from responsibility for properly estimating the difficulty or cost thereof under this Contract.
- C. The Contractor acknowledges that by personal field observation or other means satisfactory to himself, performed prior to the bid, he has included in the prices bid all costs for dealing with all construction problems created by observable above or on grade features on or adjacent to the site of the work whether these features are shown on the Plans or described in the Specifications. In instances where the observable features indicate subsurface conditions which may affect the Project work, as for example, a pavement patch or catch basin gratings indicating respectively a utility or storm sewer not shown on the Plans, the Contractor acknowledges that he has made timely, diligent, inquiry of the Engineer or by other means fully satisfied himself prior to the bid as to the nature of, and costs created by, the subsurface condition and included all costs therefore in the prices bid.

1.02 INFORMATION ON SITE CONDITIONS

- A. All information obtained by WASD regarding the site conditions, topography, subsurface information, ground water elevations, existing construction of site facilities as applicable, and similar data will be made available to the Contractor in the Contract Documents. Such information is offered as supplementary information only. Neither the Engineer nor WASD assumes any responsibility for the completeness or for the Contractor's interpretation of such supplementary information. Prior to bidding and after written approval from WASD, bidder

may make his own survey investigations to satisfy himself with site conditions at his own cost.

- B. Subsurface investigations, including test borings, have been made to indicate subsurface conditions at locations in the Project.
- C. Prospective bidders are advised, at their own expense, to make such subsurface investigation, by boring or test hole excavation, as may be desirable. However, such work is to be scheduled by appointment with the Engineer if on a WASD site or by notification to WASD and properly permitted if in the public right of way.

1.03 DIFFERING SUBSURFACE CONDITIONS

- A. In the event subsurface or latent physical conditions are found materially different from those indicated in these Documents and differing materially from those ordinarily encountered and generally recognized as inherent in the character of work covered in these Contract Documents, promptly, and before such conditions are disturbed, notify the Engineer in writing of such changed conditions.
- B. The Engineer will investigate such conditions promptly and following this investigation, the Contractor shall proceed with the work, unless otherwise instructed by the Engineer. If the Engineer finds that such conditions do so materially differ as to cause an increase or decrease in cost and time considered reasonable by the Engineer, WASD will make the final decision regarding any adjustment in cost or time for completion.
- C. In the event that site conditions differ from those expected by the Contractor, the Contractor shall proceed to complete the work as contemplated by the Plans and Specifications at his own cost and expense. If in the discretion of the Engineer, the difference in site conditions renders completion of the work as described by the Plans and Specifications impossible, the Engineer may alter the work, whereupon the Contractor shall be compensated for any extra work in accordance with Section 13 "Extra Work and Payment Therefore" of the General Covenants and Conditions; the Engineer shall not alter the work where the site conditions render the work more difficult or costly to perform, if such work is otherwise still possible as described in the Contract Documents.

1.04 EXISTING UTILITIES AND LOCATION SERVICES

- A. Known utilities and structures adjacent to or encountered in the work are shown on the Plans. The locations shown are taken from existing records and the best information available from existing plans. However, it is expected that there may be some discrepancies and omissions in the locations and quantities of utilities and structures shown. Those shown are for the convenience of the Contractor only, and no responsibility is assumed by either WASD or the Engineer for their accuracy or completeness. **No request for additional compensation or**

Contract time (except for a non-compensable time extension at the sole discretion of the Engineer, whose decision shall be final) resulting from encountering utilities or structures not shown, or differing in location or elevation from that shown, will be considered. The Contractor shall explore sufficiently ahead of the work to allow time for any necessary adjustments without delay to the progress of the installation. Costs due to delays occasioned by encountering underground utilities or structures which could have or should have been discovered by timely exploration ahead of the Work shall rest solely with the Contractor.

- B. Prior to proceeding with excavation, the Contractor shall contact all utility companies and all other users of the right-of-way in the area to aid in locating their underground services. It shall be the Contractor's responsibility to contact utility companies at least three Normal Working Days before starting construction. The Contractor shall proceed with caution in the excavation and preparation so that the exact location of underground utilities may be determined. The Contractor shall comply with Chapter 556, F.S. "Underground Facility Damage Prevention and Safety Act", Chapter 553, F.S. "Florida Trench Safety Act, Part IV", Chapter 368, F.S., "Florida Gas Safety Law, Part 1, and OSHA Standard 1926.651.
- C. It is the responsibility of the Contractor to ensure that all utility or other existing facilities, the stability of which may be endangered by the close proximity of excavation, are temporarily held in position while work proceeds in the vicinity of the facilities and that the utility or other companies concerned be given reasonable advance notice of any such excavation by the Contractor.
- D. The Contractor shall take all reasonable precautions against damage to existing utilities. However, in the event of a break in an existing water main, gas main, sewer or underground cable, the Contractor shall immediately notify the responsible official of the organization operating the interrupted utility. The Contractor shall lend all possible assistance in restoring services and shall assume all cost, charges, or claims connected with the interruption and repair of such services, as determined by the Department.

1.07 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

- A. Where the Contractor's operation could cause damage or inconvenience to railway, telephone, fiber optic, television, electrical power, oil, gas, water, sewer, irrigation system, or any other utility, the Contractor shall make all arrangements necessary for the protection of these utilities and services.
- B. Notify all utility companies that are affected by the construction operation at least 48 hours in advance. Under no circumstance expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities and utility poles where necessary. **Absolutely no extra compensation will be allowed for construction problems created by utility**

poles of whatever size, overhead electric, telephone or other lines, whether shown on the Plans or not. The Contractor is solely responsible for discerning such items in the field prior to bidding and including all costs for such work in the prices bid.

- C. The Contractor and his subcontractors shall be solely and directly responsible to the owners and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.
- D. Neither WASD nor its officers or agents shall be responsible to the Contractor for damages as a result of the Contractor's failure to protect utilities encountered in the work.
- E. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no event shall interruption of any utility service be allowed unless granted by the owner of the utility. In the event water service lines that interfere with trenching are encountered, the Contractor may, by obtaining prior approval of the water utility, cut the service, dig through, and restore the service with similar and equal materials at the Contractor's expense and as approved by the Engineer.
- G. Replace, with material approved by the Engineer, at Contractor's expense, any and all other laterals, existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract Documents and as approved by the Engineer.

1.08 INTERFERING STRUCTURES

- A. Take necessary precautions to prevent damage to existing structures whether on the surface, above ground, or underground. An attempt has been made to show major structures on the Plans. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed, and is presented as a guide. The Contractor is solely responsible for field verification of all locations.

1.9 FIELD RELOCATION

- A. During the process of construction, it is expected that minor relocations of the work may be necessary. Such relocations shall be made only by the direction of the Engineer at the Contractor's expense. If existing structures are encountered that will prevent construction as shown, notify the Engineer before continuing with the work in order that the Engineer may make such field revisions as necessary to avoid conflict with the existing structures. If the Contractor fails to notify the

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Engineer when an existing structure is encountered, and shall proceed with the work despite this interference, the Contractor does so at his own risk.

- B. Representatives of utility companies, the railroad companies, the traffic and transportation authorities, etc., shall be notified in accordance with the provisions set forth in the relevant sections of the Specifications and the permitting documents.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01016**SAFETY REQUIREMENTS AND PROTECTION OF PROPERTY****PART 1 GENERAL****1.01 CONTRACTOR'S RESPONSIBILITY FOR SAFETY**

- A. Conduct whatever work is necessary for safety and be solely and completely responsible for conditions of the job site, including safety of all persons (including employees) and property during the Contract period. This requirement shall apply continuously and not be limited to normal working hours.
- B. Neither the Professional activities of the Design Professional, nor the presence of the Design Professional nor his or her employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including but not limited to, construction means, methods, sequence techniques or procedures necessary for performing, superintending, or coordinating all portions of the Work of construction in accordance with the Project Documents and any health and safety precautions required by any regulatory agencies.

1.02 MANDATORY SAFETY TRAINING AT WATER AND SEWER TREATMENT PLANTS

- A. The Contractor shall coordinate with the Construction Manager and thereafter the Water and Sewer Department Safety Office to arrange for a mandatory (PSM) Project Safety Management training for all his personnel who will be on site. This training must be completed prior to mobilization or any other work on site. The Contractor shall also be responsible that all on-site personnel of his subcontractors, at whatever tier, receive this training. The training normally takes about 2 to 3 hours and is held at the project site.

1.03 FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS

- A. Safety provisions shall conform to the Federal and State Departments of Labor Occupational Safety and Health Act (OSHA), and all other applicable Federal, State, County, and local laws, ordinances, codes, the requirements set forth herein, and any regulations that may be specified in other parts of these Project Documents. Where any of these are in conflict, the more stringent requirements shall be followed. Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth therein.
- B. All open excavations made in the earth shall be performed in compliance with the State of Florida Trench Safety Act, OSHA 29 CFR 1926 Subpart P (Chapter 90-96, Laws of Florida). The Contractor shall appoint a "competent person", in

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accordance with Subpart P, who shall be present at the jobsite. A "competent person" shall mean one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

- C. The Contractor shall familiarize himself with the "Underground Facility Damage Prevention and Safety Act", Florida Statute 556. The Contractor shall contact the Sunshine 811, at 1-800-432-4770, (or by submitting an internet ticket entry via www.sunshine811.com) at least forty-eight hours prior to any excavation. Failure to familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth therein.
- D. Conduct operations in such a manner utilizing warning devices, such as traffic cones, barricades, and warning lights that traffic, pedestrian and Department personnel are given adequate warning of hazards of the worksite as may be deemed necessary by the Department, Engineer of Record, and governing agency having jurisdiction over the work or political subdivision.
- E. The Contractor shall be in compliance with all applicable provisions of the OSHA Code of Federal Regulations (CFR), including, but not limited to, the following:
 - 1. Process Safety Management (29 CFR 1910.119)
 - 2. Personal Protective Equipment (29 CFR 1910.132)
 - 3. Respiratory Protection (29 CFR 1910.134)
 - 4. Confined Space Entry Procedures (29 CFR 1910.146)
 - 5. Lockout/Tagout (29 CFR 1910.147)
 - 6. Industrial Truck / Forklift (29 CFR 1910.178)
 - 7. Electrical Safety (29 CFR 1910.301)
 - 8. Commercial Diving (29 CFR 1910.401)
 - 9. Air Monitoring (29 CFR 1910.1000)
 - 10. Asbestos & Lead Abatement (29 CFR 1910.1001, 1025)
 - 11. Blood Borne Pathogens (29 CFR 1910.1030)
 - 12. Crane Operations (29 CFR 1926 & ANSI)
 - 13. Fall Prevention Protection (29 CFR 1926.104)
 - 14. Welding and Cutting (29 CFR 1926.350)
 - 15. Scaffolding (29 CFR 1926.451)
 - 16. Excavation Protection (29 CFR 1926.650)
 - 17. Movement of Traffic (FDOT Index)

1.04 SAFE ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS

- A. The Contractor shall at all times provide proper facilities for safe access to the Work by authorized government officials.

1.05 CONSTRUCTION SAFETY PROGRAM

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- A. Develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The Contractor's Manual of Safety Practices outlining the firms' policies on field safety procedures for employees shall be submitted to the Engineer for review before "Notice to Proceed" will be issued. The Contractor shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.
- B. Certain products specified in these specifications contain warnings by the manufacturers that under certain conditions, if instructions for use are not followed, a hazardous condition may exist. It is the Contractor's responsibility to instruct his workmen in the safe use of the product, or any product substitution.
- C. The duty of the Engineer to conduct construction review of the Contractor's performance is not intended to include a review or approval of the adequacy of the Contractor's Safety Supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

1.06 SAFETY EQUIPMENT

- A. As part of the safety program, maintain at an office or other well-known place at the jobsite, safety equipment applicable to the Work as prescribed by the governing safety authorities, all articles necessary for giving first-aid to the injured, and establish the procedure for the immediate relocation to a hospital or a doctor's care of any person who may be injured on the jobsite.
- B. Perform all necessary work to protect all personnel and the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes, and trenches or excavations. Furnish barricades, lanterns, and proper signs to safeguard all persons and work.
- C. The performance of all work and all completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, logging, machinery guards and the like, shall be in accordance with the applicable governing safety authorities.
- D. During construction, construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railings, barricades or steel plates, as applicable, at all openings, obstructions, or other hazards. All such barriers shall have adequate warning lights as necessary, or required, for safety.
- E. There shall be no oil dripping from equipment or oil spills.

1.07 STORAGE OF HAZARDOUS MATERIALS

- A. The material shall be stored and handled in a proper and safe manner and upon its use, immediately dispose of the containers, cans, rags and remnants of the

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material in a manner approved by the Department of Regulatory & Economic Resources (RER) at the Contractor's sole cost. The Contractor is not allowed to store empty containers at the site. In case of any violation, the Engineer will report such violation to RER, and the Contractor shall be subject to all penalties and fines as required by State and County regulations.

- B. The Contractor is hereby cautioned that he cannot store any environmentally hazardous materials such as solvents, greases, lubricants, or any other type of chemical substances at the Pump Station site. The Contractor shall be allowed to keep only such materials at the site for immediate use.

1.08 ACCIDENT REPORTS

- A. If death, serious injuries, or serious damages are caused, report the accident immediately by telephone or messenger to the Engineer. In addition, the Contractor must promptly report in writing to the Engineer and WASD all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.
- B. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, promptly report the facts in writing to the Engineer and WASD, giving full details of the claim.

1.09 TRAFFIC SAFETY AND ACCESS TO PROPERTY

- A. Comply with all rules and regulations of the city, state, and county authorities regarding closing or restricting the use of public streets or highways. No public or private road shall be closed, except by express permission of WASD and the controlling authority. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all obstructions within traveled roadways by installing approved barricades, signs, and lights where necessary for the safety of the public. The convenience of the general public and residents and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner.
- B. Where traffic will pass over backfilled trenches before they are paved, the top of the trench shall be maintained with temporary asphalt that will allow normal vehicular traffic to pass over. Temporary access driveways must be provided where required. Access to businesses, schools, and homes along the route of the work shall be provided by the Contractor at all times. Cleanup operations shall follow immediately behind backfilling and the worksite shall be kept in an orderly condition at all times.
- C. Supply flagmen and guards or Police when they are required by regulation, when deemed necessary for safety, or required by the Engineer. Flagmen and Guards

shall be furnished with approved orange wearing apparel and other regulation traffic control devices.

1.10 FIRE PREVENTION AND PROTECTION

- A. Perform all work in fire-safe manner. Furnish and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. Comply with applicable federal, local, and state fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

1.11 DECLARED STATE OF EMERGENCIES

HURRICANE

- A. Hurricane Preparedness: During such periods of time as are designated by the United States Weather Bureau as being a hurricane alert, the Contractor shall perform all precautions as necessary to safeguard the work and property, including the removal of all small equipment and materials from the site, lashing all other equipment and materials to each other and to rigid construction, and any other safety measures as may be directed by the Engineer.
- B. Prior to the Start of Work: The Contractor shall submit for approval, a Plan of Action for the specific actions to be taken on his particular projects during a hurricane watch and hurricane warning.
- C. Upon Notification of a Hurricane Warning
 - 1. Formal notification to the Contractors to implement their approved Plan of Action to protect the project and the public.
 - 2. For construction projects at a Plant or Pump Station, a copy of the notifications will be provided to the Plant Superintendent or, for Pump Stations, to the Engineer. The Plant Superintendent or Engineer may notify the Construction Superintendent of any assistance he may need for the Contractor in order to secure the Plant or Pump Station.
 - 3. For pipeline construction projects within the public right-of-ways, the Contractor will be notified by the Construction Manager Office to suspend his construction operations. The Contractor will backfill all open trenches, remove all construction equipment and materials from the right-of-way, remove unnecessary traffic barricades and signs, secure remaining barricades by "half burial" or "double sandbags".

POST DISASTER WORK

- A. In the event of a disaster declaration by the Local or State governing authorities, the Department may choose to obtain the services of the Contractor to perform

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work made an imminent priority for the disaster event. The compensation for the additional work caused by the disaster shall be negotiated between the Engineer and the Contractor with written approval provided by both parties prior to mobilizing at the designated location or locations. The value of the work performed shall be up to the amount of the original contract with contingencies and dedicated allowances.

1.12 JOINT SURVEY TO ESTABLISH AUTHENTICITY OF POSSIBLE DAMAGE CLAIMS

- A. The Contractor shall maintain vertical and horizontal survey control points on all structures and improvements, located in the vicinity of the work prior to beginning work, and shall periodically check the points for movements with copies provided to the Engineer, of the survey notes for each survey and a copy of the layout of the survey control points.
- B. After the contract is awarded and before commencement of work, the Contractor shall perform a thorough examination of existing buildings, structures, and other improvements in the vicinity of the work, as applicable, which might be damaged by his operations.
 - 1. Examinations of existing structures, buildings, and other improvements in the vicinity of the work shall be done by the Contractor. The scope of the examination shall include cracks in the structures, settlement, leakage, and similar conditions. WASD assumes no responsibility for pre-existing conditions of the structure.
 - 2. Records in triplicate of all observations shall be prepared by the Contractor, photographs shall be taken by the Contractor signed and dated, with descriptive information and in the manner specified above. One signed copy of every document and photograph will kept on file in the office of the Engineer. Video recording also required.
 - 3. The above records are intended to be used as indisputable evidence in ascertaining the extent of any damage which may occur as a result of the Contractor's operations and are for the protection of the Contractor and WASD, and will be a means of determining whether and to what extent damage, resulting from the Contractor's operations, occurred during the Contract work.
- C. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such defective pavement exists prior to proceeding with any work in the vicinity. Preconstruction videos and digital pictures shall be taken with date stamps of the entire area of work. A copy of all such notices shall be forwarded to WASD.

1.13 TRAFFIC CONTROL AND USE OF PUBLIC STREETS

- A. The Contractor shall be responsible for traffic control as specified hereinafter. Any reference to Miami-Dade County, its departments, or its published regulations, permits and data, shall be synonymous and interchangeable with other recognized governing bodies over particular areas of streets or their departments, published regulations, permits, or data. Abide by all applicable laws, regulations and codes thereof, pertaining to maintenance of public streets, detour of traffic, traffic control and other provisions as may be required for this project.
- B. The Contractor shall be fully responsible for the maintenance of public streets, detour of traffic (including furnishing and maintaining regulatory and informative signs along the detour route), traffic control and other provisions, throughout the project as required by the Metropolitan Dade County Department of Public Works, Traffic Engineering Division (Traffic Division). Traffic shall be maintained according to corresponding typical traffic control details as outlined in the Dade County Public Works Manual. No street shall be completely blocked nor blocked more than one-half at any time, keeping the other half open for traffic without specific approval.
- C. If required by the Traffic Division, employ the required number of uniformed off-duty policemen to maintain and regulate the flow of traffic through the construction area. The number of men required and the number of hours on duty necessary for the maintenance and regulation of the traffic flow shall be subject to their approval. If required for traffic control permits or agencies, the Contractor shall work odd or night hours, as required for traffic control reasons, and the cost of such work shall be considered as incidental to construction.
- D. The Contractor shall provide all barricades and/or flashing warning lights necessary to warn motorists of the construction throughout the project.
- E. Excavated or other material stored adjacent to or partially upon a roadway pavement shall be adequately marked for traffic safety at all times. Provide necessary access to all adjacent property during construction.
- F. The contractor shall be responsible for the provision, installation and maintenance of all traffic control and safety devices, in accordance with specifications outlined in the Dade County Public Works Manual. In addition, provide for the resetting of all traffic control and information signing removed during the construction period.
- G. Where excavations are to be made in the vicinity of signalized intersections, attention is directed to the fact that vehicle loop detectors may have been embedded in the pavement. Verify these locations by inspecting the site of the work and by contacting the Sunshine 811, at 1-800-432-4770, (or by submitting an internet ticket entry via www.sunshine811.com). Any loop detector which is damaged, whether shown on the Plans or not, shall be repaired or replaced to the satisfaction of the Traffic Division.
- H. Notify the Traffic Division 24 hours in advance of the construction date, and 48 hours in advance of construction within any signalized intersection.
- I. Temporary pavement will be required over all cuts in pavement areas, and also where

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traffic is to be routed over swale or median areas. When the temporary pavement for routing traffic is no longer necessary, it shall be removed, and the swale or median area restored to their previous condition.

1.14 WORKING IN CONFINED SPACES

Where a Contractor needs to work in a confined space, the Contractor must comply with the General Industry, OSHA Confined Space Standard, 29 CFR 1910.146 or the equivalent Confined Space Standard in CFR 1926, Safety and Health Regulations for Construction Standards.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01150**PRE-CONSTRUCTION CONFERENCE****PART 1 - GENERAL**

1.01 General:

- A. Prior to commencement of construction, the Contractor shall attend a preconstruction conference which will be held with the Department, various utility companies, and other interested parties for the purpose of coordinating the work. All parties to this conference should be prepared to discuss any problems anticipated with the execution of the work. The time and place of meeting will be set by the Department.
- B. The Contractor is required to cooperate in order to minimize disruption of activities of other contractors. (See Section 01100)

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION** (Not Used)

END OF SECTION

SECTION 01340**SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES****PART 1 GENERAL****1.01 SCOPE OF WORK**

- A. The Department has established a "Pre-Approved Product List" for products to be used in the construction of water and sewer facilities. The "Pre-Approved Product List" lists manufacturer's product models pre-approved by the Department which meet the minimum requirements established in the Department's design and construction standards and specifications. However, not all products that may be used in the construction of water and sewer facilities that meet the Department's design and construction standards and specifications are listed in the "Pre-Approved Product List." The "Pre-Approved Product List" is not an exclusive collection of all qualified and approved products. For those products that are not on the "Pre- Approved Product List," the Contractor shall submit shop drawings as specified herein.
- B. Contractors and suppliers can submit the "Pre-Approved Product List(s)" for the products that they intend to use in the construction of the water and sewer facilities for the Project. Products listed in the "Pre-Approved Product List" do not require the submittal of shop drawings to the Department. The "Pre-Approved Product List(s)" must be stamped, reviewed and initialed by the Contractor and by his engineer, if applicable, prior to submittal to the Department. A "Submittal Summary Sheet" must accompany all "Pre-Approved Product List" submittals. Both forms can be found in the Department website at [www.miamidade.gov/water/pre- approved-product-list.asp](http://www.miamidade.gov/water/pre-approved-product-list.asp).
- B. Shop Drawings (including Pre-Approved Product List submittals) shall be submitted prior to any project construction activity. In a timely fashion, well before the contemplated ordering for fabrication of special order or long-lead items or construction use of any standard element of the work, the Contractor shall furnish Shop Drawings for the review and approval of WASD.
- C. It is the Contractor's sole responsibility, upon the first occasion of submittal of a particular element of the work, to submit Shop Drawings of an element which match and fulfill the requirements and intent of the Plans and Specifications. Any delays or costs caused, either directly or indirectly, by non-timely submissions; submission of items differing significantly from the intent of the Plans and/or Specifications; repeated submission of, or argument over, rejected elements or changes required for acceptance; arguments with the criteria or requirements of the Plans or Specifications; or any other such similar activities shall be at the expense of the Contractor.

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- D. It is the intent of the Contract Documents that the Contractor shall, in the first instance, submit Shop Drawings of elements which meet or exceed the requirements of the Contract Documents and fit with the other elements of the work and the existing conditions. Delays or the inability to obtain shop drawing approval may subject the Contractor to costs for liquidated or actual damages as specified in the Contract.
- E. The approval of Pre-Approved product sheets, shop drawings and data will be general and shall mean that upon examination of the drawings, no variations from the approved project drawings and project requirements have been discovered, and approval will not relieve the Contractor of his responsibilities as defined above. The Department's review will not constitute an approval of dimensions, quantities and details of the material, equipment or item shown.

1.02 CONTRACTOR SUBMITTALS

- A. The Contractor shall submit a minimum of four (4) hardcopies of the shop drawing submittal package to the Water and Sewer Department Document Control Section. PDF files of the entire submittal package along with the hard copies are encouraged to simplify the approval process.
- B. The Shop Drawing submittal package shall include a transmittal, submittal registry and the pre-approved product list or shop drawing sheets stamped by the Contractor.
- C. The Contractor shall meet with the Department Engineer (Construction Manager) the after Project Award to begin the shop drawing submittal process and establish a schedule for submittal and approval.
- D. Where there is a deviation from the Specifications, the Contractor shall note it and state the reasons why a deviation is required.

1.03 DESCRIPTION OF WORK

- A. Submit to the Engineer for review and approval, Shop Drawings, test reports and data on materials, equipment, and material samples as required for the proper control of work, and as specified in the Specification sections. Shop Drawings shall be submitted for all materials and equipment to be furnished.
- B. After award of the project, the Contractor may begin providing submittals for approval. Submit to the Engineer a complete list of preliminary data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite

final review of Shop Drawings.

- C. Maintain an accurate updated Shop Drawing submittal log which shall include the following items:
1. Submittal Description and Number Assigned
 2. Specification Section
 3. Plans Sheet Number
 4. Date to Engineer
 5. Date Returned to Contractor (from Engineer)
 6. Status of Submittal (Approved, Approved as Noted, Rejected/Resubmit)
 7. Date of Resubmittal and Return (as Applicable)
 8. Date Material Release (for Fabrication)
 9. Projected Date of Fabrication
 10. Projected Date of Delivery to Site
 11. Status of O & M Manuals Submittal

1.04 CONTRACTOR'S RESPONSIBILITY

- A. Furnish the Engineer with a schedule of Shop Drawings submittals, fixing the respective dates for the submission of Shop Drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- B. Submit to the Engineer all plans and schedules sufficiently in advance of construction requirements to provide maximum time for checking and appropriate action from the time the Engineer receive them.
- C. It is the duty of the Contractor to check and approve all plans, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Plans and data shall bear Contractor's stamp showing that they have been checked and approved. Shop Drawings submitted to the Engineer without the Contractor's stamp and approval shall be returned to the Contractor for conformance with this requirement before Engineer's review. **Shop Drawings shall indicate any deviations in the submittal from requirements of the Project Documents and the Contractor shall state the reason why a deviation is required.**
- D. All submittals shall be accompanied by a submittal registry and transmittal letter containing the following information:
1. Date
 2. Project Title and Number
 3. Contractor's name and address
 4. The number of each Shop Drawing, Data, and Sample submitted
 5. Notification of Deviations from Project Documents
 6. Submittal Log Number conforming to and referring to Specification Section Numbers

- E. Submit seven copies of Shop Drawings and of descriptive or product data submittals necessary to complement Shop Drawing. The Engineer will retain five sets.
- F. After receiving approval by the Engineer, the Contractor shall be responsible for submitting the Shop Drawings to the Building Department. Shop Drawings of all premanufactured items and all other Shop Drawings are required to obtain approval prior to manufacturing or installing the submitted items. The Contractor shall also be responsible for contesting any interpretations by the Building Department that WASD considers non-acceptable. The Contractor shall include in the bid prices, all costs for permits, fees and expenses associated with the submittals, including resubmittals (if any) of Shop Drawings to the Building Department. The Building Department as used in this paragraph shall be taken to mean the Miami-Dade County Building Department and/or other governing building authority appropriate to this project.
- G. Do not begin any of the work covered by a drawing, data, or a sample returned as "Rejected/Resubmit" until a revision or correction thereof has been reviewed and returned to the Contractor, by the Engineer, with approval or approval "As Noted". Be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to receiving Engineer's approval or approval "As Noted" of the necessary Shop Drawings.
- H. Be fully responsible for observing the need for and for making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment the Contractor proposes to supply, both as they pertain to the Contractor's own work, work of others, or of other Divisions herein or Trades and clearly show such changes on the Shop Drawings.
- I. When substitutions in materials or equipment are allowed, the Contractor shall make all necessary changes in adjacent or connected structures and equipment at his expense. Where contemplated changes, substitutions, or appurtenant work require engineering design, in the opinion of the Engineer, the Contractor shall have such design services performed at his expense. Said engineering design services shall be of an extent satisfactory to the Engineer whose word shall be final and shall be performed by a Registered Professional Engineer licensed to practice in the State of Florida.
- J. When substitutions in materials or equipment are allowed, the Contractor shall be solely responsible for all costs and time required by any differences in construction methods, fabrication or assembly required and no additional time will be allowed.
- K. When a construction change, initiated by the Contractor or resulting from a change made by the Contractor, requires re-permitting as discussed in the preceding paragraph, the Contractor shall be responsible for all labor, material and equipment required to redraw the Plan sheet or sheets affected by the change to the satisfaction of the Engineer of Record and WASD. The costs for all work of

this sort and all costs of re-permitting shall be borne by the Contractor and no extra compensation will be allowed.

L. Determine and verify:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with specifications
5. That installation and maintenance clearances are sufficient particularly when equipment or arrangement changes have been made

1.05 ENGINEER'S REVIEW OF SHOP DRAWINGS

A. Engineer's review of plans, data and samples, submitted by the Contractor will cover only general conformity to the Drawing and Specifications. The Engineer's review will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown. The review of plans and schedules will be general, and shall not be construed:

1. As permitting any departure from the Contract requirements
2. As relieving the Contractor of responsibility for any errors, including detail, dimensions, and materials
3. As approving departures from details furnished by the Engineer, except as otherwise provided herein

B. Variations

1. If the plans or schedules, as submitted, describe variations per paragraph 1.03C and show a departure from the Contract requirements which Engineer finds to be in the interest of WASD and to be so minor as not to involve a change in Contract price or time for performance, the Engineer may return the reviewed plans without noting an exception.
2. If the plans or schedules, as submitted, describe variations, and show a departure from the Contract requirements which the Engineer finds to be minor enough to be corrected by redlining the submittal, the engineer will mark and return the submittal marked "Approved as Noted." The redlined corrections shall be as binding on the Contractor as would be a resubmission embodying the same corrections.

C. When reviewed by the Engineer, each of the Shop Drawings shall be stamped and dated to indicate it had been reviewed. Shop Drawings stamped "Revise and Resubmit" and with required corrections shown will be returned to the Contractor for correction and resubmittal.

D. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions and corrections required by the Engineer on previous submittals. The Contractor shall make any corrections required by the Engineer.

E. If the Contractor considers any correction indicated on the Shop Drawings to

constitute a change to the Project Plans or Specifications, the Contractor shall give written notice thereof to the Engineer who will render a decision which shall be final. After the decision has been made, the Contractor shall without delay, provide the corrections to the plans.

- F. When the Shop Drawings have been approved by the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- G. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the Engineer, all submittals shall be made in groups containing all associated items for systems, processes or as indicated in specific specifications sections. All plans, schematics, manufacturer's product data, certifications and other Shop Drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.

1.06 SHOP DRAWINGS

- A. When used in the Project Documents, the term "Shop Drawings" shall be considered to mean Contractor's plans for materials and equipment which become an integral part of the Project. These Shop Drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance/test data shall be considered only as supportive to required Shop Drawings as defined above.
- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations, and other standard descriptive data shall be clearly marked to identify pertinent materials, product or models. Information which is not applicable to the Work shall be deleted by striking or cross hatching.
- C. Shop Drawing shall have a submittal registry and display the following:
 - 1. Project Title and Number
 - 2. Name of Project Building or Structure
 - 3. Number and Title of the Shop Drawing
 - 4. Date of Shop Drawing or Revision
 - 5. Name of Contractor and Subcontractor Submitting Drawing
 - 6. Supplier/Manufacturer
 - 7. Separate Detailer when Pertinent

- 8. Specification Title and Number
- 9. Specification Section
- 10. Application Project Drawing Number

- D. If plans show variations from Contract requirements because of standard shop practice or for other reasons, describe such variations in the letter of transmittal. If no explanation of these variations is provided, the Contractor shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such plans have been reviewed and approved.
- E. For all mechanical and electrical equipment furnished, provide a list including the equipment name, address of and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.
- F. All manufacturers or equipment suppliers who propose to furnish equipment or products shall submit an installation list to the Engineer along with the required Shop Drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least five years, unless otherwise specified. Manufacturers and/or equipment which fails to meet the specified experience period will be considered if the manufacturer or supplier provides a bond or cash deposit which will guarantee replacement of the equipment or process in the event of failure or unsatisfactory service.
- G. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.

1.07 REQUIRED INFORMATION

- A. Submit, as applicable, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, process system, and equipment work:
 - 1. Shop Drawings or equipment drawings, including dimensions, size and location of connections to other work, and weight of equipment
 - 2. Catalog information and cuts
 - 3. Installation or placing plans for equipment, drives, and bases
 - 4. Supporting calculations, signed, and sealed by a Florida Registered Engineer when required, for equipment and associated supports, or hangers required or specified to be designed by equipment manufacturers
 - 5. Signed and sealed calculations and plans by in-house Florida Registered Professional Engineer for structural systems, indicating compliance to the structural design criteria specified in the Plans
 - 6. Complete manufacturer's specifications, including materials description and paint system
 - 7. Performance data and pump curves
 - 8. Suggested spare parts with current price information
 - 9. List of special tools required for testing, checking, parts replacement, and maintenance. (Special tools are those which have been specially designed

or adapted for use on parts of the equipment, and are not customarily and routinely carried by maintenance mechanics)

10. List of special tools furnished with the equipment
11. List of materials and supplies required for the equipment prior to, and during startup
12. List of materials or supplies furnished with the equipment
13. Special handling instructions
14. Requirements for storage and protection prior to installation
15. Requirements for routine maintenance required prior to equipment startup
16. List of all requested exceptions to the Project Documents

1.08 SUBMITTAL REQUIRED FOR FOREIGN MANUFACTURED ITEMS

- A. In addition to the submittal requirements stated above, suppliers of foreign manufactured items shall submit the names and addresses of companies within the United States that maintain technical service representatives and a complete inventory of spare parts and accessories for each foreign-made item proposed for incorporation into the Work. Failure to prove these capabilities shall be cause for rejection of the foreign manufactured items.
- B. Foreign manufactured equipment and materials shall in all cases be clearly and permanently marked with the manufacturer's name and country of origin of the item. The name of the U.S. importing/supplying firm is not acceptable. Shop Drawing submittals of foreign-made items shall be accompanied by written information to include name and location (i.e. country, City, and street address) of the manufacturer. This requirement shall also apply to the foreign made elements of items assembled in this country from parts wholly or partially manufactured over- seas.
 1. The words "Permanently Marked" as used in this paragraph shall mean; die stamped, cast-in, welded, or otherwise marked such that the removal of the marking by any mechanical or chemical means will result in obvious permanent damage to the surface marked. These markings shall be on surfaces which are not hidden by assembly.
- C. Where specified elsewhere herein or at the sole discretion of the Engineer, whose word shall be final, supply verification of quality, suitability, or other aspects, as directed by the Engineer, from a Professional Engineer licensed to practice in the State of Florida or the state where the supplying U.S. firm is located. The verification shall be signed, sealed, and dated. All costs for this verification shall be at the sole expense of the Contractor and no extra compensation will be allowed. Verification by foreign-based engineers, firms, manufacturers, etc. will not be acceptable. Verification by means of a very stringent foreign testing agency/standard (for example ISO 9000 series) may be acceptable. However, this shall again be at the sole discretion of the Engineer and the full burden of proof and satisfaction of WASD shall rest with the Contractor. No extra time will be permitted due to the requirement for verification and the Contractor has the sole responsibility to make

his submittals with all necessary information in a timely fashion.

1.09 SAMPLES

- A. Furnish for the approval of the Engineer, samples required by the Project Documents or required by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices
 - 2. Full range of color, texture, and pattern
 - 3. A minimum of two samples of each Item shall be submitted
- C. Each sample shall have a label indicating:
 - 1. Name of Project
 - 2. Material or Equipment Represented
 - 3. Name of Producer and Brand (if any)
 - 4. Location in Project
- D. Prepare a transmittal letter in triplicate for each shipment of samples containing the information specified herein in Paragraph 1.06 A. Enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use specified and shall not be construed to change or modify any Contract requirements.
- E. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved shall be returned to the Contractor at his expense, if so, requested at time of submission.

1.10 SUBSTITUTIONS

- A. Changes in products, materials, equipment, and methods of construction required by the Contract Documents, which are proposed by the Contractor after award of the Contract, are considered to be requests for substitutions. Where the Plans and/or Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use. Articles or products of similar characteristics may be offered for the approval of the Engineer, whose decision shall be final. Copies of complete descriptive data shall be furnished regarding all materials furnished by the Contractor, consisting of Dimension drawings, catalog references, product data, cost, and other information

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necessary to clearly identify and evaluate each article. When substitutions are permitted, the Contractor shall make all necessary changes in adjacent, connected, or other structures and equipment at his expense.

- B. Where engineer-recommended changes, substitutions or appurtenant work require engineering design, the Contractor shall have such design services performed. Those engineering design services shall be of an extent satisfactory to the Engineer, whose decision shall be final. Engineering services for engineer-recommended changes, substitutions, or appurtenant work, shall be performed by a Registered Professional Engineer licensed to practice in the State of Florida.
- C Unless specifically authorized by the Engineer in writing, no additional contract time will be allowed, and a decrease in time may be appropriate.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01380**CONSTRUCTION PHOTOGRAPHS AND VIDEO PHOTOGRAPHY****PART 1 GENERAL****1.01 DESCRIPTION OF WORK**

- A. This section specifies the taking and submission of construction photographs and audio-video photography.
- B. Prior to the delivery of any equipment, materials or supplies to the site of any work, or to the beginning of any of the construction work, the Contractor shall provide pre-construction photography as specified herein for the purpose of establishing the surface conditions existing in all of the areas to be affected by the construction of the Project.
- C. Ground photography shall consist of photographs and color video taping of surface features taken along the entire length of the Project and including all work, intersecting roadways and properties that will be impacted by the water service conversions.
- D. The purpose of the color audio-video taping of the project is to provide the necessary information for restoration of surface features after completion of the Project. The Contractor shall be responsible for repairing any damage or defect not documented as existing prior to construction.

1.02 QUALITY ASSURANCE

- A. Photographs shall be clean, sharp and clearly show details. Out-of-focus photographs will not be acceptable.
- B. Photographs and/or prints which are poorly lit or lack definition will not be acceptable.

1.03 SUBMITTALS

- A. Submit three (3) prints and the digital file of each construction photograph and one (1) DVD of the video as follows:
 - 1. Within fourteen (14) days of receiving Notice to Proceed.
 - 2. Enclose each print in a clear Mylar protector punched to fit a standard three ring binder. Prints shall have notes to detail location, date, and existing condition. The prints shall be used to provide documentation of existing conditions in case of claims or disputes.
 - 3. Number photographs in sequence beginning with the numeral one.

PART 2 PRODUCTS**2.01 SIZE AND QUALITY**

- A. Standard commercial quality prints, color, 3½-inches by 5-inches, single weight glossy paper.
- B. Digital pictures and videos shall be compatible with Department software.

2.02 IDENTIFICATION

- A. Each print shall be stamped with the following information stamped or typed on the back of the print:

MIAMI DADE WATER & SEWER DEPARTMENT

Contract No. _____

DESIGN-BUILDER: _____

Photograph No. _____ Date: _____ Time: _____

Description: _____

2.03 QUANTITY

- A. A minimum of twelve photographs shall be taken prior to construction and twelve more each month until completion of the Work.
- B. In the instance of a pipeline installation, take a minimum of one photograph each 200 feet or fraction thereof along the entire route of the main initially. During construction a minimum of one photograph every two hundred feet or fraction thereof of that portion of the main constructed during the month until completion.
- C. The number of photographs required shall be at the sole discretion of the Engineer whose decision shall be final.
- D. An increase in the number of photographs above the minimums shall not be cause for an increase in cost and no extra compensation will be allowed.

2.04 VIDEO PHOTOGRAPHY

- A. Color audio-video shall be DVD format.

PART 3 EXECUTION**3.01 INITIAL AND CONSTRUCTION PHOTOGRAPHY**

- A. Take pre-construction photographs of the entire site or route of the main after receiving the Notice to Proceed and prior to disturbing the site in any manner. Coordinate with the Engineer as to the vantage points and number of photographs required in Paragraph 2.03.
- B. Photography During Construction: Coordinate with the Engineer as to the actual number and location of views to be photographed and the day and time of photographing.
- C. Photographic equipment utilized shall be of sufficient quality to produce pictures capable of being enlarged without loss of definition or sharpness.

3.02 VIDEO PHOTOGRAPHY

- A. Coverage of Taping: Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, streets, signs, landscaping, trees, catch basins, fences, visible utilities, and all buildings located within the work zone of the Project. Of particular concern are any existing faults, fractures, defects, or other features. Audio description shall be made simultaneously with and support the video coverage.
- B. Streets: shall be recorded by audio-video tape for the full width of the right-of-way, except where specifically noted otherwise by the Engineer.
- C. Front, Side and Rear Yard Areas: shall be recorded by audio-video tape of properties impacted by the water service conversions.

3.03 LOCATION INFORMATION

- A. All DVDs shall be properly identified by number, location and project name in a manner acceptable to the Engineer.
- B. A record of the contents of each DVD shall be supplied on a run sheet identifying each segment in the tape by location, i.e., street viewing side, traveling direction, engineering stationing, and all referenced by tape counter numbers.
- C. All video recordings shall begin with the date and time of recording, the project name, the sheet numbers of engineering stationing as shown on the plans, the name of the street, area or building being taped, the direction of travel and the viewing side. Houses and buildings shall be identified visually by house or building address, when possible, in such manner that the progress of the taping and the proposed system may be located by reference to the houses and buildings.

3.04 SITE RECORDING CONDITIONS

- A. All audio-video taping shall be done during times of good visibility. No outside taping shall be done during periods of visible precipitation or when the ground area is covered with leaves or debris, unless otherwise authorized by the Engineer.

- B. In order to produce the proper detail and perspective, adequate auxiliary lighting will be required to fill in shadow areas caused by trees, utility poles, road signs and other such objects, as well as other conditions requiring artificial illumination.
- C. The average rate of speed in the general direction of travel of the conveyance used during taping shall not exceed 60 feet per minute. Planning rates and zoom-out rates shall be controlled sufficiently so that playback will produce adequate clarity of the object being viewed.
- D. When conventional wheeled vehicles are used as conveyances for the taping, the distance from the camera lens to the ground shall be such as to ensure proper perspective. In instances where tape coverage will be required in areas not accessible to conventional wheeled vehicles, such coverage shall be obtained by walking or by special conveyance approved by the Engineer but with the same requirements for tape quality and content as specified herein, except as may be specifically exempted by the Engineer.

END OF SECTION

SECTION 01581

PROJECT SIGNS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Project Signs.

1. County Responsibility: To supply, erect and remove signs.
2. Contractor Responsibility: To maintain signs and restore site.

PART 2 PRODUCTS

2.01 PROJECT SIGNS

- A. Signs will be supplied, installed, and at the end of construction, removed by County forces. During the construction period, the Contractor shall maintain the signs in good condition, satisfactory to the Engineer. Should the signs be defaced, damaged or destroyed, the Contractor shall be responsible for their repair or replacement to the satisfaction of the Engineer and no extra compensation will be allowed.

PART 3 EXECUTION

3.01 MAINTENANCE

- A. Maintain signs and supports and repair all damages to the satisfaction of the Engineer.
- B. Restore site to original condition upon completion of Project.

END OF SECTION

SECTION 01600**MATERIAL AND EQUIPMENT SHIPMENT,
HANDLING, STORAGE, AND PROTECTION****PART 1 GENERAL****1.01 SCOPE OF WORK**

- A. This shall include both WASD and Contractor supplied material and equipment.
- B. The Contractor is to inform all subcontractors, suppliers, and manufacturers of the requirements herein specified and shall include expenses for the following services in his costs for compliance with the requirements hereinafter specified.

1.02 PREPARATION FOR SHIPMENT

- A. When practical, equipment shall be factory-assembled. The equipment parts and assemblies that are shipped unassembled shall be furnished with assembly plan and instructions. The separate parts and assemblies shall be factory match-marked or tagged in a manner to facilitate assembly. All assemblies are to be made by the Contractor at no additional cost to WASD.
- B. Machined and unpainted parts subject to damage by the elements shall be protected with an application of a strippable protective coating, or other approved protective method.
- C. Equipment shall be packaged or crated in a manner that will provide protection from damage during shipping, handling, and storage.
- D. The outside of the package or crate shall be adequately marked or tagged to indicate its contents by name and equipment number, if applicable; approximate weight; state any special precautions for handling; and indicate the recommended requirements for storage prior to installation.

1.03 PACKING AND DELIVERY OF SPARE PARTS AND SPECIAL TOOLS

- A. Properly mark to identify the associated equipment by name, equipment, and part number. Parts shall be packaged in a manner for protection against damage from the elements during shipping, handling, and storage. Ship in boxes that are marked to indicate the contents. Delivery of spare parts and special tools shall be made prior to the time associated equipment is scheduled for the initial test run.

1.04 SHIPMENT

- A. All equipment and material shall be shipped with freight and shipping paid FOB

jobsite.

- B. The Contractor shall request a 7-day advance Notice of Shipment from manufacturers, and, upon receipt of such notice, provide the Engineer with a copy of the current delivery information concerning equipment items and material items of critical importance to the project schedule.
- C. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer.
- D. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.

1.05 RECEIVING

- A. The Contractor shall unload and record the receipt of all equipment and materials at the jobsite.
- B. All costs for receiving, inspection, handling, storage, insurance, inventory control, and equipment maintenance for both for both the Contractor-supplied and WASD-supplied materials and equipment shall be included in the prices bid and no extra compensation will be allowed.

1.06 INSPECTION

- A. Immediately upon receipt of equipment and materials at the jobsite, the Contractor shall inspect for completeness and any evidence of damage during shipment. WASD's supplied equipment and material shall be inspected and inventoried together with WASD's inspector. Should there appear to be any shortage or damage, the Engineer shall be immediately notified; and the Contractor shall be fully responsible for informing the manufacturers and the transportation company of the extent of the shortage or damage. If the item or items require replacing or supplying missing parts, the Contractor shall take the necessary measures to expedite the replacement or supply of the missing parts.

1.07 HANDLING

- A. Equipment and materials received for installation on this Project shall be handled in accordance with the manufacturer's recommendations, and in a manner that will prevent damage.
- B. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such a manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All

lifting, pulling, or pushing mechanisms shall be applied to the exterior of the pipe or fitting. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the Engineer. Pipe shall be stored on blocking or timber. It shall not be stored on rocks, boulders, or other supports which in the opinion of the Engineer are unsuitable. Such materials shall be so placed as to keep obstruction to traffic to a minimum.

1.08 STORAGE AND PROTECTION

- A. Equipment and materials shall be stored prior to installation as recommended by the manufacturer. Generally, materials such as pipe shall be stored off the ground in approved storage yards or along the line of the proposed pipeline as approved by the Engineer. Items subject to the damage by the elements, vandalism, or theft shall be stored in secure buildings. Items requiring environmental control for protection shall be provided with the necessary environmentally controlled storage facilities at no cost to WASD.
- B. Store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instructions shall be studied by the Contractor, and he shall review them with the engineer. Instructions shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.
- C. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- D. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored, the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.
- E. All mechanical, electrical, and other equipment, instruments, and other items subject to damage if stored outdoors (even though covered by canvas) shall be stored in a weather tight building to prevent injury. The building, even if temporary, must be satisfactory to the Engineer. Building shall be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.
 - 1. All equipment shall be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer.
 - 2. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment at least half load, once

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weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

3. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of final acceptance.
4. Prior to final acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

- F. All bolts, nuts, gaskets, and other joint materials for use in pipelines shall be stored under cover.
- G. Gaskets shall be stored in their original packing bags or containers, and care shall be exercised to keep them away from heat, light, oil gasoline or other petroleum products. Gaskets shall be kept clean at all times and not handled with greasy or dirty hands.
- H. Plastic pipe and other elastomeric products shall be stored under cover to preclude damage by ultraviolet radiation even if the product has UV inhibitors in its compound.
- I. Valves and other equipment having heating elements to eliminate moisture accumulation shall be supplied with electrical power of the required characteristics.

1.09 INSURANCE

- A. The Contractor's insurance shall adequately cover the value of materials delivered but not yet incorporated into the work. The Contractor and WASD shall be named as co-insured insofar as their respective interests may appear. Proof of this coverage must be submitted to the Engineer at the time request for progress or partial payments.

1.10 INVENTORY CONTROL

- A. Equipment and materials shall be stored in a manner to provide easy access for inspection and inventory control. The Contractor shall keep a running account of all materials in storage to facilitate inspection and to estimate progress payments for materials delivered but not installed in the work.

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1.11 EQUIPMENT MAINTENANCE PRIOR TO DEPARTMENT'S ACCEPTANCE

- A. Provide the required or manufacturer's recommended maintenance during storage, during the installation, and until such time as WASD accepts the equipment for full-time operation.

1.12 SALVABLE EQUIPMENT

- A. Any salvable pipe, fitting, or other miscellaneous material or equipment removed during construction and not reused in the work shall be cleaned, hauled, and stored by the Contractor at his own expense, where directed by the Engineer, and shall remain the property of WASD. All other material shall be disposed of by the Contractor at his own expense.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01710**CLEANING****PART 1 GENERAL****1.01 SCOPE OF WORK**

- A. This Section specifies the maintenance of the work site in a clean, orderly, hazard-free condition.

1.02 QUALITY ASSURANCE

- A. Conduct cleaning and disposal operations in accordance with local ordinances and anti-pollution laws. Rubbish, volatile wastes, and other construction wastes shall be neither burned nor buried on the work site, and shall not be disposed of into storm drains, sanitary drains, streams, or other waterways.
- B. Final cleaning shall be accomplished either by workmen experienced in cleaning operations or by professional cleaners.

1.03 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with local codes, ordinances, regulations, and anti-pollution laws. Do not burn or bury rubbish or waste materials on Project site. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains. Volatile wastes shall be disposed in accordance with proper laws and be approved by the Department. Do not dispose of wastes into streams or waterways.

PART 2 PRODUCTS**2.01 ON-SITE WASTE CONTAINERS**

- A. Provide on-site waste containers for collection of waste materials, debris, and rubbish. See Section 01100 - Special Project Procedures, Subsection 1.05 regarding Safety Requirements for environmentally hazardous materials.

2.02 CLEANING MATERIALS

- A. Cleaning materials shall be as recommended by the manufacturer of the surface to be cleaned.

PART 3 EXECUTION**3.01 SAFETY REQUIREMENTS**

- A. Maintain work site in accordance with local ordinances and anti-pollution laws

applicable to work site cleanliness and in a neat, orderly, and hazard-free condition until final acceptance of the work. Catwalks, accessible underground structures, work site sidewalks and walkways adjacent to the work site shall be kept free from hazards caused by construction activities.

- B. Store volatile wastes including rags in covered metal containers and remove from work site daily.
- C. Prevent accumulations of wastes which create hazardous conditions.
- D. Artificially ventilate spaces which are not naturally ventilated when volatile or noxious substances are present in those spaces.

3.02 CLEANING DURING CONSTRUCTION

- A. Perform cleaning every workday for duration of the Work. Structures, grounds, and areas of the work site, access roads and adjacent public and private properties shall be maintained free from accumulations of waste materials and rubbish caused by construction operations on the work site. Place waste materials and rubbish in on site containers or as otherwise approved. Unneeded construction equipment shall be removed and all damaged repaired so that the public and property owners will be inconvenienced as little as possible.
- B. Remove or secure loose material on open decks and on other exposed surfaces at end of each day's work or more often to maintain work site in hazard-free condition.
- C. Prevent dislodgement of materials due to wind and other forces. Wet down dry materials and rubbish to lay dust and prevent blowing dust. Cover or wet excavated material leaving and arriving at the site to prevent blowing dust. Clean the public access roads to the site of any material falling from the haul trucks.
- D. Empty on-site waste containers whenever necessary so that trash overflow does not occur. Legally dispose of contents at either public or private dumping areas.
- E. Control the handling of materials, debris, and rubbish; do not drop or throw from heights.
- F. Immediately remove spillages of construction-related materials from hauling routes or the site.
- G. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.

3.03 FINAL CLEANING

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- A. In addition to the cleaning performed above, in preparation for final inspection, remove grease, dust, dirt, rust stain from surfaces. Remove labels, fingerprints, and other foreign materials from exposed exterior finished surfaces. Flush down all manhole covers and frames, valve boxes, and areas leaving such surfaces clean of all sand, laitances, etc.
- B. In preparation for final acceptance or occupancy, conduct final inspection and cleaning of exposed exterior surfaces, and of concealed spaces.
- C. Maintain cleaning operations until project has been finally accepted.

END OF SECTION

SECTION 01720**PROJECT RECORD DOCUMENTS****PART 1 GENERAL****1.01 DESCRIPTION**

- A. Scope of Work: For contracts where the work is performed at an on-site location maintain one record copy of:
1. Record Drawings. Record Drawings as used herein shall mean a drawing that accurately records constructed improvements and any field changes.
 2. Record Specifications.
 3. Addenda.
 4. Change Orders and other modification of the contract.
 5. Engineer's written orders or instructions.
 6. Approved Shop Drawings, Product Data and Samples.
 7. Field Test records.
 8. Construction photographs.
 9. As built dimensions and elevations as recorded by the Contractor's Florida Licensed Professional Surveyor and Mapper (PSM) on a daily basis.
 10. Field Book. Survey Field notes taken by the Florida Licensed Professional Surveyor and Mapper's survey crew (copy provided to the Engineer on a monthly basis).
- B. The records listed above are to be made available to the Engineer at all times for all projects.
- C. Related Requirements Described Elsewhere:
1. Section 01340: Shop Drawings, Product Data and Samples.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Maintain documents in a clean dry, legible, condition and in good order. Do not use record documents for construction purposes.

1.03 REQUIRED MEASUREMENTS

- A. Set-up and Verification: The Contractor's Florida Licensed Professional Surveyor and Mapper is required to recover the design baseline and verify the elevations and coordinates on a regular basis as needed.
- B. The Contractor is required to have a level instrument setup next to the construction site in order to control the vertical alignment of the pipe installation

prior to trench backfilling. The level shall be setup daily for use by the surveyor, Contractor's foreman and Department Engineer/Inspector. Any underground construction work that does not have a level properly setup will be stopped by the Department Engineer/Inspector.

- C. The Contractor is required to have a survey crew record the field information on a daily basis when there is underground pipe installation. The survey crew shall be on-site as needed to record and verify the information before it is covered. Any underground construction work that does not have the information recorded by a survey crew will be stopped by the Department Engineer/Inspector. The Engineer/Inspector has the authority to order re-excavation of work that was covered without accurate survey measurements.
- D. Field Book Information: The Florida Licensed Professional Surveyor and Mapper is required to have his crews make daily visits to the project site during underground pipe installation work to perform field measurements of the Contractor's daily installations. This information shall be recorded in field books. Copies of the field notes are required to be provided to the Construction Manager on a monthly basis. The surveyor's field notes of the surveyor shall be submitted to the Department along with partial as-builts plans (signed and sealed) on a monthly basis as a condition of payment.

1.04 PROJECT RECORDS

- A. During the life of the Contract the Contractor shall retain the services of a Florida Licensed Professional Surveyor and Mapper (PSM) who shall maintain daily records of the installation, including all deviations from Plans and Specifications and for the purposes of preparing and submitting to the Department an as-built/record survey in compliance with:
 - 1) Florida Statutes Chapter 472.027.
 - 2) Florida Administrative Code Chapter 5J-17.050, 5J-17.051 and 5J-17.052
 - 3) As further required by these Contract Documents.
- B. The Measure and Recording of all information required in Subsection A above for all projects concurrently with construction progress. The services of the Florida Licensed Professional Surveyor and Mapper for the project shall be retained by the Contractor prior to the issuance of the Notice to Proceed. A letter from the Florida Licensed Professional Surveyor and Mapper shall be provided at the preconstruction meeting indicating that the Contractor has secured his services to perform all survey work for the duration of the project and prepare final as-builts plans.
- C. Submit redlines, partially completed as-built plan sheets and fully complete as-built Plan sheets and certified copies of field book information to include raw data of the measurements all as required by and satisfactory to, the Engineer as

prerequisite for the acceptance of monthly payment applications.

- D. Label each document "PROJECT RECORD" in neat large, printed letters.
1. Record all information for pipeline projects and on-site projects concurrently with construction progress.
 2. Do not conceal any work until as-built information is recorded by the Contractor's surveyor.
 3. All locations for future connections or tie-ins shall be left unburied and uncovered until the Contractor's PSM measures and records the as-built information.
 - a. All as-built and inspector information is to be made available to the Engineer on a daily basis for inclusion in the M-D WASD records.
 4. Restrained pipe, end line valves, thrust blocks shall be left uncovered for the last complete length. Inline valves and tees shall be left exposed for 1 length on both sides plus the face end. Measure and record the elevation, horizontal and vertical alignment, and the inclination for these items.
 5. For all projects, the Contractor's PSM shall maintain exact and extensive records of any deviations from Drawings and Specifications. These records shall be satisfactory to the Engineer, whose decision shall be final, and sufficient to allow the production of accurate as built Plans which correctly and completely portray the work as constructed.
 6. For all projects, the Contractor's PSM shall record data as follows during the entirety of construction.
 - a. For facility (e.g., a water or sewage plant, pumping station, or similar site, if so designated by M-D WASD) projects, record as-built dimensions and elevations every twenty-five feet (25') or portion thereof along pipeline and at every abrupt change in direction of the new line.
 - b. For pipeline projects, constructed in the public right-of-way, record dimensions and elevations every one hundred feet or portion thereof along the pipeline and at every horizontal and vertical change in direction.
 - c. In all cases, record locations and elevations for each valve, fitting, service line, fire hydrant, water sampling point, utility poles adjacent to the proposed line, overhead wires crossing the ditch line (approximate height above grade) and other appurtenances along the pipeline.
 - d. The identity, dimensions, location, and elevation of any existing utility crossing the proposed line and so immediately adjacent to the new line as to be exposed by the excavation, shall also be

recorded. Locate, excavate, expose, and record the same data for any utility shown in the plans whose proximity to the proposed pipeline could affect the certification requirements of the new installation. Note that in instances of a very wide ditch due to ground conditions, the recording of data for adjacent, paralleling utilities shall only be required for lines which come within three feet of the outside of the pipe being installed, unless otherwise ordered by the Engineer whose decision shall be final.

- e. Without exception, for all thrust blocks, the top elevation, outer dimension, thickness of the block, length, and location of any sheet piling, if used, shall be recorded by the Contractor's PSM.
- f. Specific locations and elevation of equipment, the buildings and miscellaneous items installed inside them shall be recorded as applicable and as required by the Engineer.
- g. Without exception, where the substitution of another piece of equipment for that shown on the Plans has been allowed, the footprint, clearance, and elevation dimensions shall be recorded by the Contractor's PSM, and these changes shall be accurately and thoroughly portrayed on the as-built plans.
- h. Contractor's Licensed Surveyor shall prepare from the field data, as-built record drawings showing correctly, completely, and accurately the installation, embracing all changes and deviations made during construction, including all construction variances, to reflect the work as it was constructed.
- i. Record Drawings shall be prepared as specified hereinafter.
- j. Record Drawings and five (5) copies shall be signed and sealed by the Surveyor and shall be submitted to the Department for the Engineer's review within ten (10) calendar days following the completion date of successful pressure testing of all mains and appurtenances under this Contract.
- k. If the Engineer determines that the Drawings are not acceptable, they will be returned to the Contractor with a cover letter noting the deficiencies and/or reasons for the disapproval. Contractor shall have ten (10) calendar days to correct all exceptions taken by the Engineer and resubmit as-built record drawings to the Engineer for final acceptance.

1.05 MECHANICAL, STRUCTURAL AND ELECTRICAL AS-BUILT RECORDS

- A. The mechanical, structural, and electrical information on as-builts for Pump Stations and Plant work shall be reviewed and signed and sealed by a Florida Registered Professional Engineer when designated as the responsible party for the corresponding portion of the as-builts.
- B. The Engineer shall verify that all mechanical, structural and electrical information on the as-built the work was constructed as designed on the Design Plans. Any deviation shall be noted and approved by the Department.
- C. Capital Improvement Projects contracted by the Department shall be certified by

the Construction Manager or Engineer of Record that the work was constructed as designed on the Design Plans with any deviation shall be noted and approved by the Department.

1.06 PROPERTY BOUNDARIES

- A. The Florida Licensed Professional Surveyor and Mapper shall establish and maintain throughout the construction the property boundaries of pump stations and easements. The surveyor shall verify that the work of the project does not encroach into adjacent (abutting) property. Property corners lost during construction shall be reset at the first opportunity to ensure that the work is done within the designated limits.
- B. The as-builts for pump stations or other Water and Sewer Department above ground facilities in an easement or designated property shall show all property corners, setbacks and dimensions of the structure and appurtenances. All information required of a boundary survey shall be contained on the as-built plans. A boundary survey signed and sealed by a PSM shall be a part of the as-built plans.

1.07 DRAWINGS

- A. During the life of the Contract, maintain records of all deviations from the Plans and Specifications and prepare therefrom As-Built Record Drawings showing correctly and accurately all changes and deviations made during construction to reflect the work as it was actually constructed. It is the responsibility of the Contractor to check the As-Built Record Drawings for errors and omissions prior to submittal to the Department and certify in writing that the As-Built Record Drawings are correct and accurate, including the actual location of all piping, exposed and internal piping, and electrical/signal conduits in or below the concrete floor. Indicate the size, depth, and voltage in each conduit.
- B. Legibly Mark to Record Actual Construction: All data as previously specified for all installations by the Contractor's PSM. For on-site structures and facilities work the Contractor's Florida Registered Land Surveyor shall record:
 - 1. Depths of various elements of foundation in relation to finish first floor and datum plane.
 - 2. All exposed and underground piping and ductwork with elevations and dimensions and locations of valves, pull boxes, etc. Changes in location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent reference points, plant survey grids, property lines and similar.
 - 3. Location of internal utilities and appurtenances concealed in the construction shall be referenced to visible and accessible features of the structure. Air conditioning ducts with locations of dampers, access doors, fans and other items needing periodic maintenance.
 - 4. Field changes in dimensions and details.
 - 5. Changes made by Engineer's written instructions or by Change Order.

6. Details not on original Contract Drawings.
 7. Equipment and piping relocations.
 8. Major architectural and structural changes in structures, including tanks.
 9. Architectural schedule changes according to Contractor's record and shop drawings.
 10. Record Drawings shall be prepared as specified hereinafter.
- C. Specifications and Addenda: Legibly mark each section to record:
1. Manufacturer, trade name, catalog number and Supplier of each product and item of equipment actually installed.
 2. Changes made by Engineer's written instructions or by Change Order.
- D. Approved Shop Drawings: Provide record copies for system diagrams and drawings together with each element of process equipment, piping, electrical system and instrumentation system.

1.08 SUBMITTALS

- A. Accompany submittal with transmittal letter in duplicate, containing:
1. Date
 2. Project title and number
 3. Contractor's name and address
 4. Title and number of each Record Document
 5. Signature of Contractor or his authorized representative.
- B. Record Drawings with five copies which have been signed and sealed by the surveyor shall be submitted to the M-D WASD for the engineer's review. Drawings shall conform to recognized drafting standards. As-built drawing shall be submitted on 24-inch by 36-inch bond paper. These materials shall be submitted to the WASD for the Engineer's review as a prerequisite for payment during the course of construction as previously specified and final, complete sets of documents within ten calendar days following the completion date of successful testing of all mains, equipment and appurtenances under this Contract. Final payment will not be made until the five sets of as-built record drawings (with AutoCAD file) and five sets of prints have been approved and accepted by the Engineer.
1. In cases where a portion of a pipeline system or parts of a process system are put into service, the above conditions shall apply for the in-service portion and monthly payments shall be withheld until the as-built drawings are accepted by the Engineer.
 2. As-Built Record Drawings, as prepared by the Contractor's Florida Licensed Professional Surveyor and Mapper and submitted by the Contractor, shall comply with following criteria and standards:
 - a. Title block must show the Contract or Project Title (as applicable); Contract number; WASD ER, PCTS, RPQ numbers; Contractor's name; Engineer of Record's name.

- Surveyor's name and address; date; location; and where appropriate to the work, size, and type (i.e., water main, sanitary gravity main, sanitary force main) of main.
- b. Baselines or centerlines must be tied to section corners, monument line and right-of-way lines.
 - c. Pipeline must be tied to baseline or centerline with stations and offsets.
 - d. Baselines or centerlines must show bearings or deflection angles, or delta, radius, chord, and arc length for curves.
 - e. Show all horizontal curve data, including point of curvature (PC) and point of tangency (PT) stations or radial bearing.
 - f. Stationing must be the same as shown on construction drawings and must be tied to Section corners, centerline intersections and all other pertinent control points within the Project. All such pertinent points shall have their stationing shown and where there is dual stationing for a point, both stations shall be called out.
 - g. Identify all streets by name or number and show stationing at all intersecting streets.
 - h. Refer to vertical datum plane and identify the location, elevation and source supplying the benchmark used.
 - i. Tie easement lines to survey baseline or platted centerline and right-of-ways.
 - j. Show horizontal and vertical locations of all fittings, deflections, or at any significant change of direction, and at a maximum of 100-foot intervals along the pipeline for off-site (e.g., in the public right-of-way) and at maximum 25- foot intervals for on-site (e.g., on a facility such as a pump station or plant work).
 - k. On all pipe fittings of 36-inch diameter or over, (i.e., tees bends, crosses, wyes, increasers/reducers, bevels) elevations must be taken at the end and center points to reflect the true elevation and altitude of the fitting.
 - l. Elevations of natural ground or pavement over the pipeline must be shown at each position where the pipe elevation is shown and at intervening high and low points.
 - m. Manhole rim and valve box rim elevations must be shown.
 - n. Show all invert and bottom elevations in manholes and valve vaults or boxes. Show all invert and bottom elevations together with pipe size, and where it can be determined, pipe material, for existing structures having pipes which cross the pipeline being constructed.
 - o. Locations and elevations together with diameter, thickness, and material of all casings.
 - p. Location, top and bottom elevations of all sheeting left in place.
 - q. Coordinate values used inside plants shall be the local, WASD established coordinate systems referenced to the property boundary.
 - r. State plane coordinate values for all new valves and manholes; on existing valves and manholes at points of connection or closest to the point of connection and the point of connection

itself.

3. Certification: The Contractor shall certify on as-built record drawings all other actual constructed details and information as may be required by the WASD including but not limited to:
 - a. Pipeline must be identified by type of pipe material, manufacturer, type of joint and type of joint restraint.
 - b. Valves shall be identified by size, type, end condition; and n valves 16-inch or larger, the manufacturer's name and number of turns required to open or close the valve.
 - c. Show calculated pipeline percent of grade between manholes of gravity systems.
 - d. Types and sizes of sheeting and piling together with measured and complete; location, dimensional, and elevation data on any pile caps, tie backs, anchors, whalers or other appurtenant structures left in place.
- C. Digital Records: WASD requires the submittal of as-built drawings in AutoCAD for Windows format and in PDF format. Graphical information contained on magnetic media shall be the same as provided on plan sheets. Digital Records shall be delivered to the WASD Project Manager containing a list of all files and data being provided. The AutoCAD file shall be compatible with the Department system and capable of being uploaded without external reference files.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01740**PERMITS****PART 1 GENERAL****1.01 SCOPE OF WORK**

- A. Where WASD has obtained various permits for this Project, copies will be appended at the rear of the Specifications.
- B. The Contractor shall be familiar with, and comply with, all requirements of these permits. All other necessary permits shall be obtained by the Contractor and be paid for as specified below in 1.01, G.
- C. Unless otherwise specifically stated elsewhere in the Contract Documents, Supply Plans and Calculations for work not designed by WASD that are preponderantly of a structural nature shall be signed and sealed by a Professional Engineer registered in the State of Florida as stated in the Florida Building Code; Section 104.2.1, 104.2.2; and Section 202 which each read as follows:
 - 1. All information, Plans, Specifications and accompanying data shall bear the name and signature of the person responsible for the design.
 - 2. Design professional: If the design professional is an architect or engineer legally registered under the laws of this state regulating the practice of architecture or engineering, then he/she shall affix their official seal to said Plans, Specifications and accompanying data, as required by Florida Statute.
 - 3. Engineer: A Florida-registered engineer (Section 202).
- D. The Contractor's particular attention is called to any Special Conditions of the permits relating to construction procedures, excavation and backfill requirements, open trench restrictions, turbidity control and all other general and special conditions, including flowable fill and pavement details. In the event any of the conditions of the permits are in conflict with the requirements of these Specifications, the more stringent conditions shall take precedence. The Contractor is to conform to all regulations of the governmental agencies having jurisdiction over this work, whether or not included in the permit.
- E. Any deviations from the Plans, Specifications or permits appended thereto, must first be approved by the Engineer even if approval for the change has been given by the permitting agency.
- F. The Contractor shall assume throughout the life of the Contract all obligations and responsibilities imposed on WASD or other County departments as permittee of the above-mentioned permits. All expenses necessary for compliance with the

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regulations and requirements of each permitting agency and its permit shall be borne by the Contractor and shall be included in the overall bid price.

- G. The cost of any fees such as impact fees, inspection fees, etc. and the cost of all required permits shall be borne by WASD. The Contractor shall pay the required fees, obtain the permit(s) and then upon submission of proof of cost to WASD, be reimbursed for said cost out of the Approved Permit Fee Reimbursement Item. This shall apply only to required permits and fees. Permits obtained or fees paid for the advantage of the Contractor or non-required permits obtained for whatever reason shall not be reimbursed. The necessity or non-necessity of a permit or fee shall be determined by the Engineer whose word shall be final. As specified in the paragraph above, all costs of compliance with the permit(s) shall be borne by the Contractor and included in the bid price.
- H. All surveying required by the Project permits shall be done by the Contractor's Florida Registered Surveyors and Mapper. This includes staking out limits of construction, maintaining baselines and preparing monthly as-builts.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02314

EXCAVATION, BACKFILL AND FILL FOR STRUCTURAL FACILITY AND UTILITY SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK:

- A. The work included under this Section consists of furnishing material and equipment, and performing all labor necessary for excavating, backfilling, filling, and compaction of areas to be occupied by facilities or utility systems to be constructed.
- B. Plan For Excavation: Prior to commencing the excavation, the Contractor shall submit a plan of his proposed operations to the Engineer of Record for approval. The Contractor shall consider, and his plan for excavation shall reflect, existing utilities that are to remain, the equipment and methods to be employed in the excavation.

1.02 QUALITY ASSURANCE

All excavations shall conform with South Florida Building Codes, the State of Florida Trench Safety Act, OSHA requirements and the provisions herein. Excavations shall be executed in accordance with all applicable requirements of Section 01016, including notification of Sunshine State One-Call Center (1-800-432-4770) 48 hours prior to any excavation.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Structural Fill: Structural fill shall consist of an inorganic, non-plastic, granular soil containing less than 10 percent material passing the No.200 mesh sieve (relatively clean sand or crushed limerock with a 2-inch max. particle size) with a Unified Soil Classification of GP, GW, SP, SP-GM, SW-SM or SP-SM.
- B. Ballast Rock: Ballast rock shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.65. It shall be crushed rock conforming to the following gradation:

<u>U.S. Standard sieve size</u>	<u>Percent by weight passing</u>
1-1/2 inch	100
3/4 inch	30-75
1/2 inch	15-55
1/4 inch	0-5

- C. Suitable Backfill Material: Backfill material shall be clean and free from all organic material, clay, marl or unstable materials, debris, lumps, or broken paving. No rocks or stones larger than 6 inches in diameter shall be allowed in any backfill. Material for backfill may be material resulting from excavation, if suitable in the opinion of the Department.

- D. **Select Backfill Material:** Select backfill material specified herein shall meet all the general requirements for backfill material set forth above, and in addition, shall be free of any rocks or stones larger than 2 inches in diameter. Select backfill material may be material resulting from trench excavation, if suitable in the opinion of the Department, carefully selected to comply with these requirements.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. **Clearing:** The construction site shall be cleared of all obstructions and vegetation, including large roots and undergrowth, within 5 feet of the lines of excavation, in accordance with Section 02230. All debris created by this clearing operation shall be hauled from the site and disposed of by the Contractor.
- B. **Removals:** Complete all removals within the lines of excavation prior to beginning excavation. Where required, all existing shrubbery, trees, grass, sprinklers, fences signs, mailboxes, structures, sidewalks, curbs, utility poles, or structures subject to damage resulting from the excavation should be transplanted, relocated, braced, shored, or otherwise protected and preserved.

3.02 EXCAVATION

- A. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and depths shown on the approved plans, but in all cases as required for construction, and as specified herein. All excavations shall be made by open cut.
- B. When the walls of the excavations are to be kept vertical and in order to protect the safety of workmen, the general public, this or other work or structures, or excavation walls, or pipe installation including materials encountered in the excavation which have a tendency to slough or flow into the excavation, undermine the banks, weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by steel sheeting, stabilization, grouting or approved methods. Said methods shall comply with the Trench Safety Act (TSA). Sheeting and shoring or other approved method shall be designed by a Professional Engineer licensed to practice in the State of Florida.
- C. For structures, the Contractor shall maintain the bottom of the excavation firm and dry and maintain an elevation of the water one (1) foot below the concrete to be placed, by use of pumps, tremie or other acceptable method.
- D. In areas where trench widths are not limited by right-of-way or easement widths, property line restrictions, existing adjacent improvements including pavements, structures, and other utilities, and maintenance of traffic, the trench sides may be sloped to a suitable angle of repose of the excavated material.
- E. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.

- F. Excavated material shall be stored and disposed of in such a manner that they will not interfere unduly with traffic on public streets and sidewalks. In congested areas, such materials, cannot be stored adjacent to the trench nor used immediately as backfill, shall be removed to convenient places of storage. If any material is creating a public hazard or other unsafe condition, it shall be removed immediately to a storage area.
- G. Materials suitable for use as backfill be hauled to and used in areas where not enough suitable material is available from the excavation. Material unsuitable for use in backfill shall be removed promptly and disposed of by the Contractor. Any pockets of organic matter, concrete or other unsuitable material encountered in excavating shall be removed and replaced with material satisfactory to the Department.
- H. The excavation of walls for forms will not be permitted.
- I. Excavation for structures:
 - 1. Clear, as stated above, all existing items or structures in the way of the proposed pipeline or structures and excavate as necessary to the depths and dimensions shown on the Plans, but in all cases as necessary for satisfactory installation.
 - 2. Where pavements or sidewalks are cut, they shall be cut by means of a mechanical pavement saw to form true and straight edges which shall, in general, be either parallel or at right angles.
 - 3. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such defective pavement exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the Department.
 - 4. Where interlocking steel sheeting is used, the Department may require that the sheeting be cut off at a level two (2) feet above the top of the installed pipe and that portion below the level be left in place.
 - 5. Excavation for manholes and other piping appurtenances shall be sufficient to leave at least two (2) feet clear between their outer surfaces and the embankment or sheeting.
 - 6. If, in the opinion of the Engineer of Record or the Department, the soil at that depth is unsatisfactory as foundation material because it contains marl, muck, organic matter, or other unsuitable material, the excavation shall be continued two (2) feet deeper, except if a suitable foundation material is exposed at a lesser depth, further excavation will not be required.
 - 7. When the pipe to be installed in a trench requires the pipe installers to work under and around the pipe, the Contractor may request the Department that he be allowed to exceed the 12" maximum clearance, specifying the clear distance desired.
 - 8. The ends of existing mains shall be temporarily capped or plugged to keep them clean, and the ends of all mains shall be temporarily anchored to keep the joints from blowing apart from internal pressure until the new mains can be reconnected to them.

9. In addition to specific construction methods specified, the general requirements in subsequent subsections, below, shall apply to the work of this project.

3.03 DEWATERING

- A. Any water which accumulates in the excavations for structures shall be removed promptly by means satisfactory to the Engineer of Record in such a manner as to not create a nuisance to adjacent property or public thoroughfare. Pumps and engines for dewatering systems shall be operated with mufflers and at a minimum noise level suitable to a residential area. The Contractor shall be responsible for any nuisance created due to the disposal of the water from his drainage system.
- B. Where applicable, the Contractor shall be required to obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way or into any existing drainage structure or facility.

3.04 STOCKPILED MATERIALS

Suitable materials removed from the excavation shall be stored and disposed of in a manner which will not interfere with traffic at the site. Material suitable for backfill and not needed for backfill at the structure but needed elsewhere shall be stockpiled until moved and used elsewhere.

3.05 BACKFILL

- A. The excavation shall then be brought to the structures bottom elevation by placing and compacting 6-inch layers of Oolitic limerock (or material previously defined) to 95 percent of maximum density as determined by AASTHO T-180. Structural fill shall be supplied by the Contractor except as may otherwise be carefully selected from excavated material if deemed suitable in the opinion of the Engineer. Backfill around new structures up to the pavement base or surface of the ground shall be material not exceeding 6-inches in diameter and shall be compacted in layers not exceeding 9 inches. Each layer shall be compacted with a powered hand tamper, or other approved method to at least 98% of maximum density as determined by AASHTO T-180
- B. Backfill for precast manholes shall be drainfield limerock or specified pipe bedding material to a level to receive the manhole at the proper elevation.

END OF SECTION

SECTION 02315**TRENCHING AND BACKFILLING FOR PIPING SYSTEMS****PART 1 - GENERAL****1.01 WORK INCLUDED**

- A. The work included under this Section consists of excavating, backfilling and compaction as required for the construction of the piping systems as specified herein. (See Section 02314 for excavation for structures.)
- B. All excavations shall be executed in accordance with the South Florida Building Codes, the State of Florida Trench Safety Act (TSA), OSHA requirements and all applicable requirements of Section 01016, including notification of Sunshine State One-Call Center (1-800-432-4770), 48 hours prior to any excavation.

PARTS 2 - PRODUCTS**2.01 BACKFILL MATERIAL**

- A. Except where a 1:10 cement/sand or flowable fill concrete mix is required (See Section 02745), granular soil backfill materials shall be utilized. Suitable backfill material shall be clean, shall not be expansive nor have high organic content, shall be free of clay, marl, unstable materials, debris, lumps, and clods, and shall meet the following requirements:
 - 1. Maximum Liquid Limit shall not exceed 12 as determined by ASTM D 423.
 - 2. Maximum Plasticity Index shall not exceed 35 as determined by ASTM D 424.
 - 3. Not more than 10 percent of weight shall be finer than 74-micron (No. 200) U.S. Standard Sieve.
- B. Backfill material containing limerock shall have sufficient sand to fill the voids in the limerock. No stones or rocks larger than 6-inches in diameter will be permitted in any backfill. Backfill material placed to a point at least one foot (1 ft.) above pipe and appurtenances shall be select backfill material not exceeding 2-inches in diameter. For PVC gravity sewers backfill material placed at least two feet (2 ft.) above pipe shall be select backfill material not exceeding 2-inches in diameter. In any case, above this point, but up to the upper 6-inches of the trench, backfill shall be of material not exceeding 6-inches in diameter.
- C. Debris, broken paving or broken concrete shall not be used.
- D. Material for backfill may be material resulting from excavation, only if it meets the above mentioned requirements, or if suitable in the opinion of the Department. If sufficient suitable backfill material, including select backfill material, is not available from the site, additional material shall be furnished.

2.02 SELECT BACKFILL MATERIAL

Select backfill material specified in these specifications or required by the Plans shall meet all the general requirements for backfill material set forth above, and in addition, shall be free of any rocks or stones larger than 2 inches in diameter. Select backfill for copper tubing shall be limerock screenings or sand. Select backfill material may be material resulting from excavation, if suitable in the opinion of the Department, carefully selected to comply with these requirements.

2.03 BEDDING MATERIAL

Pipe bedding material shall consist of one of the following types of material, and accordance with the Department's Standard Details: (See Section UC-300 for Gravity Sewer Piping Foundations)

- A. Bedding may be select backfill material, as specified above, if approved by the Department.
- B. Crushed stone (or drainfield limerock) shall be used for bedding of piping (except for copper pipe) and/or manholes as shown on the Standard Details. Crushed stone shall consist of hard, durable, sub-angular particles of proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines, and other deleterious materials. The stone shall conform to the requirements of ASTM C 33, Size No. 57 (3/4-inch rock) and be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1 ½-inch	100
1-inch	95 to 100
½-inch	25 to 60
No. 4	0 to 10
No. 8	0 to 5

- C. Sand for bedding copper pipe shall be a dry screened sand. Sand shall be graded sand with 100 percent passing a 3/8-inch sieve and not more than 5 percent passing a No. 200 sieve.
- D. Limerock screenings, sand or other fine material shall not be used for bedding.
- E. All pipe bedding material shall be new, unless otherwise approve by the Department. Existing pipe bedding material may not be used.

2.04 BACKFILL UNDER MANHOLES AND METER VAULTS

Any excavation below the levels required for the proper construction of manholes or meter vaults shall be filled with Class C concrete. The use of earth, rock, sand or other materials for this purpose will not be permitted. (See Section 02314 for excavation for structures.)

PART 3 - EXECUTION

3.01 CLEARING

- A. The Contractor shall perform all clearing necessary for the proper installation of all piping and appurtenances in the locations shown in the Drawings, in accordance with Section 02230, "Clearing and Grubbing".
- B. Where required, all existing shrubbery, trees, grass, sprinklers, fences, signs, mailboxes, structures, sidewalks, curbs, utility poles or structures subject to damage resulting from the excavation should be transplanted, relocated, braced, shored, or otherwise protected and preserved.

3.02 EXCAVATION

- A. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and depth shown on the Drawings. All excavations shall be made by open cut.
- B. When the walls of the excavations are to be kept vertical and in order to protect the safety of workmen, the general public, this or other work or structures, or excavation walls, or pipe installation including materials encountered in the excavation which have a tendency to slough or flow into the excavation, undermine the banks, weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by steel sheeting, stabilization, grouting or approved methods. Said methods shall comply with the Trench Safety Act (TSA). Sheeting and shoring or other approved method shall be designed by a Professional Engineer licensed to practice in the State of Florida.
- C. In areas where trench widths are not limited by right-of-way or easement widths, property line restrictions, existing adjacent improvements including pavements, structures, and other utilities, and maintenance of traffic, the trench sides may be sloped to a suitable angle of repose of the excavated material, but only from a point one foot above the crown of the pipe.
- D. A substantially and safely constructed moveable shield or box, as approved by the Engineer of Record, may be used in place of sheeting, except where specifically called for on the Plans to install sheeting. Where a moveable shield or trench box, is used in place of sheeting and shoring, the trench shall be opened immediately ahead of the shield as pipe laying proceeds inside the shield.
- E. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.
- F. Materials removed from the trenches shall be stored and disposed of in such a manner that they will not interfere unduly with traffic on public streets and sidewalks. In congested areas, such materials, cannot be stored adjacent to the trench nor used immediately as backfill, shall be removed to convenient places of storage. If any material is creating a public hazard or other unsafe condition, it shall be removed immediately to a storage area.
- G. Materials suitable for use as backfill be hauled to and used in areas where not enough suitable material is available from the excavation. Material unsuitable for use in backfill shall be removed promptly and disposed of by the Contractor
- H. Excavation for Pipes and Piping Appurtenances (See Section UC-300 for additional requirements for gravity sewer piping):

1. Clear, as stated above, all existing items or structures in the way of the proposed pipeline or structures and excavate as necessary to the lines and grades shown on the Plans.
2. Where pavements or sidewalks are cut, they shall be cut by means of a mechanical pavement saw to form true and straight edges which shall in general be either parallel or at right angles with the centerline of the pipe.
3. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such defective pavement exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the Department.
4. Excavate pipe trenches to a minimum of 6-inches below the outside bottom of the proposed pipe barrel to provide for the installation of the bedding material.
5. If, in the opinion of the Department, the soil at that depth is unsatisfactory as foundation material because it contains unsuitable marl, muck, organic matter, or other unsuitable material, the excavation shall be continued 2 feet deeper, except if a suitable foundation material is exposed at a lesser depth, further excavation will not be required.
6. If the soil is still unsuitable after the additional excavation as prescribed above, the trench bottom shall be excavated further in one-foot increments in accordance with "Trench Overcut", below.
7. Sheet piling and shoring shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, or structures.
8. Where wood sheet piling or certain designs of steel sheet piling are used, the Department may require the sheet piling to be cut off at a level 2-feet above the top of the installed pipe and that portion below that level shall be left in place.
9. If interlocking steel sheet piling is used, the Department may permit its complete removal in lieu of cut-off, providing removal can be accomplished without disturbing the bedding, pipe or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed utility caused by removal of sheet piling shall be cause for rejection of the affected portion of the work. Not more than 100-feet of trench shall be opened ahead of pipe laying operations at one time unless a greater length of open trench is approved by the Department.
10. Trench widths, when measured at a point 12 inches above the top of the pipe, shall provide a 12-inch maximum clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheet piling if used. Minimum trench width shall provide at least 6-inches clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheet piling if used.
11. Excavation for appurtenances, such as manholes and valves, shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation or sheet piling, if used, of not less than 12-inches. Manhole excavations shall be carried to sufficient depth to permit their construction on the undisturbed bottom of the excavation.

12. Excavation for thrust block shall be made in such a manner so that, when concrete is placed, it will bear against a firm, undisturbed, vertical trench wall with bearing is in accordance with the schedule shown in the Standard Details.
 13. Selected backfill shall then be placed and compacted in 6-inch layers up to the level of the pipe bedding material.
 14. When the pipe to be installed in a trench requires the pipe installers to work under and around the pipe, the Contractor may request the Department that he be allowed to exceed the 12" maximum clearance, specifying the clear distance desired. The decision of the Department in this regard shall be final.
 15. The ends of existing mains shall be temporarily capped or plugged to keep them clean, and the ends of all mains shall be temporarily anchored to keep the joints from blowing apart from internal pressure until the new mains can be reconnected to them.
 16. In addition to specific construction methods specified, the general requirements in subsequent subsections, below, shall apply to the work of this project.
- I. Excavation for PVC Gravity Sewers and Service Laterals:
1. The Contractor shall make all excavations necessary for the construction of the gravity sewers and service laterals to the lines and grades shown on the Plans, and in accordance with the Standard Details.
 2. In stable soils, trench widths when measured to a point 12 inches above the top of the pipe shall provide a 12-inch maximum clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used. Minimum trench widths under the same conditions shall be 6-inches on each side for the pipe for 4-inch and 6-inch pipe, and 9-inches on each side of the pipe for 8-inch pipe and larger. Minimum trench widths are required to provide room for a man to place and compact the haunching and initial backfill material. Embedment material shall be Class I. (See Section UC-300)
 3. In unstable soils (defined as peat, much or other organic soils, elastic silts and clays below the water table, and fine sands below the water level), trench widths when measured at a point 12-inches above the top of the pipe shall be a minimum of five (5) nominal pipe diameter in width. Slightly greater width is at the Contractor's option in order to accommodate his trenching equipment, but the pipe bedding material shall extend to the face of the excavation, or sheeting if used. Embedment material shall be Class II. (See Section UC-300)

3.03 TRENCH STABILIZATION

Trench bottoms which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes, shall be stabilized. In no event shall pipe be installed when such conditions exist. The Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation.

3.04 TRENCH OVERCUT

- A. If, after excavating the trench to a depth of 2 feet 6 inches below the outside bottom elevation of the proposed pipe barrel, and the soil at that depth is still unsatisfactory as foundation material because it contains marl, muck, organic matter, or other unsuitable material, the pipe trench shall be excavated further in one-foot depth increments until a suitable foundation material is found. As a point of reference, it has been the Department's experience that, typically, trench overcut does not extend to depths more than 6 feet. However, the Department reserves the right to require trench overcut to depths up to 6 feet, i.e., to a point 8.5 feet below the bottom of the pipe.
- B. Select backfill, as defined above, shall then be compacted in 6-inch layers up to the bottom of the proposed 6 inches of pipe bedding.

3.05 REMOVAL OF WATER

- A. It is a basic requirement of these Specifications that excavation shall be free from water before pipe or structures are installed. However, it is realized that in certain sections of the work this cannot be accomplished economically, and the Contractor may request permission to use the "Alternate Method of Construction" defined below.
- B. The Contractor shall provide all necessary pumps, underdrains, well point systems, and other means for removing water from trenches and other parts of the work including structures. The Contractor shall continue dewatering operations until the backfill has progressed to a sufficient height over the pipe to prevent flotation or movement of the pipe in the trench, so that the backfill is above the natural water level.
- C. Where applicable, the Contractor shall be required to obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-away or into any existing drainage structure or facility.
- D. Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the work completed or in progress, to the surface of the streets, or to cause interference with the use of the same by public. Submit the proposed method of handling and disposal of trench waster for approval before starting the excavation.
- E. The Contractor is cautioned that Dade County or other governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting, or limiting, the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches. Obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way, or into any existing drainage structure or facility.
- F. Pumps and engines for dewatering systems shall be operated with mufflers and a minimum noise level suitable to a residential area. The Contractor shall be responsible for any nuisance created due to the disposal of the water from his discharge system.

3.06 INSTALLATION OF BACKFILL

- A. Backfilling of pipe trenches will not be allowed until the work has been approved by the Department, pressure tested if required, and the Department indicates that backfilling may proceed. Any work which is covered or concealed without the knowledge and consent of the Department shall be uncovered or exposed for inspection. Partial backfill may be made to help restrain the pipe during pressure testing, if previously authorized by the Department.
- B. The Contractor shall backfill all trenches and other excavations made in the process of installing the pipe. He shall maintain the surface of the backfill free from major irregularities and potholes.
- C. Select backfill material shall be placed under and around the pipe to one foot above the crown (or to two feet above crown for PVC gravity sewers) in 6-inch layers. Each layer shall be thoroughly compacted to at least 90 percent of maximum density as defined by AASHTO Standard No. T-180, "Moisture-Density Relations of Soils using a 10-lb. (4.54 kg.) Rammer and an 18-in. (457 mm) Drop". The material in the ditch may be compacted by either hand tamper or a mechanized power tamper, provided the results obtained meet the continued approval of the Department. Particular attention and care shall be exercised in obtaining thorough support for the branch of all service connection fittings. Care shall be taken to preserve the alignment and gradient of the installed pipe.
- D. Backfilling and compacting of material lying above a point one foot (or two feet for PVC pipe), above the crown of the pipe and below the pavement base or the surface of the ground, if out of pavement, shall be accomplished in layers not exceeding 9 inches in thickness. Each layer shall be thoroughly compacted with a powered hand tamper or a mechanized power tamper to at least 98 percent of maximum density as determined by AASHTO Specification T-180 or such greater density as may be required by the governing authority over the area in which the work is performed. A testing laboratory will make periodic field tests to determine the density being obtained in each lift, or layer, or the backfill. When compacted backfill fails to meet the specified percentage of maximum density as shown by test results, it shall be reworked and recompact, and then retested. The reworking, recompact and retesting of the backfill shall be repeated as many times as may be necessary to obtain compacted backfill with density meeting or exceeding the specified percentage as indicated by test results.
- E. The Contractor shall exercise proper care to insure that no pipe will be broken or displaced through the use of the type of mechanical compacting equipment he selects. Water shall be added as required to obtain optimum moisture to facilitate compaction, but ponding or inundation of backfill will not be permitted. These ponding limitations shall not prohibit backfill in a wet trench up to the level of the natural water table if the "Alternate Method of Construction" is utilized.
- F. Backfill shall in general be kept up with the rate of pipe laying. The backfill up to the springline of the pipe shall be placed as soon as practical after the laying of the pipe. On parts of the line where ground water level may be high enough to float the pipe, the placing of the backfill and the rate of pumping the trench shall be so controlled as to prevent the pipe from floating or moving from the line and grade shown on the Plans.
- G. In the event that sufficient suitable material is not available at any point to properly backfill the trench, the Contractor shall transport suitable material from points of the line where such material is available or shall otherwise furnish suitable material.

- H. Suitable material in excess of all backfill requirements and all unsuitable material shall be removed from the work and disposed of by the Contractor.
- I. Within paved areas of trench excavation, the base and surfacing shall be reconstructed as specified under Section 02745, "Pavement Removal and Replacement".
- J. Where cuts have been made through unpaved, stabilized rock roadways, driveways and parkways, surface restoration shall consist of 3 inches of compacted limerock overlaid by 3 inches of gravel or graded and washed rock with a maximum diameter of ½-inch, except as otherwise directed by the Department. The rock shall be installed over the entire width of the disturbed area and shall closely match the existing rock at each location. Several grades of rock may be required to attain this end, but it is not anticipated that more than one grade will have to be used at any one location.
- K. Backfill for Structures: See Section 02314.

3.07 INSTALLATION OF PIPE BEDDING - FORCE MAIN AND WATER MAIN

- A. As described above, all pipe trenches shall be excavated to a level 6-inches below the outside bottom of the proposed pipe barrel. The resulting excavation shall be backfilled with approved pipe bedding material, up to the level of the outside bottom of the proposed pipe barrel. This material shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe, including recesses for the pipe bells and couplings. Placing and compacting bedding up to the level of the lower one-third of the pipe barrel shall immediately follow the installation of the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.
- B. Select Backfill material may be utilized where the excavated trench bottom is above water.
- C. Any excavation below the levels required for installation of the pipe bedding shall be backfilled with approved bedding material, tamped, compacted, and shaped to provide proper support for the proposed pipe.
- D. For installation of gravity sewers, see Section UC-300, "Gravity Sewer Pipe Foundation".

3.08 COMPACTION AND DENSITIES

- A. Methods of control and testing of backfill construction to be employed in this work are:
 - 1. Maximum density of the material in trenches shall be determined by AASHTO Designation T 180.
 - 2. Field density of the backfill material in place shall be determined by AASHTO Designation T 238.
- B. Laboratory and field density tests are necessary to establish compliance with the compaction requirements of these specifications. The Department will not accept projects for which successful laboratory and field density test results are not submitted. Tests will be made at depths and locations to the satisfaction of the Department.

- C. Trench backfill which does not comply with the specified densities, as indicated by such tests, shall be reworked and recompact until the required compaction is secured.

3.09 ALTERNATE METHOD OF CONSTRUCTION

A. General:

1. A combination of conditions in the substrata, water table, or method of disposal may be encountered during the course of the work which make dewatering impossible, or only possible through the use of unusual methods, the cost of which is excessive. When such conditions are encountered, but only after all reasonable means to dewater the excavation have been employed without success, the Contractor, with the concurrence of the Department may elect to employ the following alternate method of construction. The concurrence of the Department shall be obtained, and the Contractor shall limit the use of the alternate method of construction to such specific portions of the work as determined applicable.
2. The requirements set forth in other sections of these Specifications shall establish the required standards of construction quality for this work. Use of the alternate method of construction described hereinafter shall in no way be construed as relieving the Contractor of his basic responsibility for satisfactory completion of the work.
3. Subject to all of the requirements stated hereinabove, including approval by the Department, construction will be permitted in accordance with the following specifications.

- B. Removal of Water: The installation of pipe, manholes and appurtenances under water will be permitted and the dry-trench requirements of "Removal of Water" will be waived.

- C. Excavation: Excavation shall be performed in accordance with normal applicable excavation specifications.

D. Pipe Bedding for Ductile Iron and Vitrified Clay Pipe:

1. Pipe bedding shall be placed from 6-inches below the outside bottom of the proposed pipe barrel up to the level of the springline of the pipe barrel of gravity sewers and to the level of the lower one-third of the pipe barrel for force mains or water mains. The bedding material shall be washrock, drainfield limerock or approved material. Limerock screenings, sand or other fine organic material shall not be used.
2. The bedding material used shall be tamped and graded to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

- E. Bedding for PVC Pipe: The pipe bedding, haunching and initial backfill material shall conform to embedment material listed in Section UC-300 for either stable or unstable soil conditions as required and shall be placed and compacted in as stated in "Installation of Pipe Bedding", above.

F. Backfill:

1. After the pipe is installed, backfilling shall proceed in accordance with the provisions of "Installation of Backfill", except that select backfill material or pipe bedding material shall be used to backfill around the pipe and to a level one foot above the outside top (crown) of the pipe. Under no circumstances shall material other than select backfill or specified pipe bedding material be considered satisfactory for this purpose.
2. If the Alternate Method of Construction is used, all backfill material, shall be carefully lifted into the trench and released to fall freely therein when the bucket or container is near or at a moderate height above water level. Height of release shall be to the satisfaction of the Department. Below the existing water level, and to a point not more than 18-inches above the water level, the backfill material shall be carefully placed into place in uniform layers, of equal depth on each side of the pipe. From a point not more than 18-inches above the water level, and below the pavement base or the surface of the ground if out of paving, backfill material shall be placed and compacted for normal backfilling as provided in "Installation of Backfill" and "Compaction and Densities".

G. Backfill for PVC Gravity Sewers:

1. After the pipe is installed, backfilling shall proceed in accordance with the provisions of "Installation of Backfill", except that select backfill material or pipe bedding material shall be used to backfill to a level two feet above the outside top (crown) of the pipe. Under no circumstances shall material other than select backfill or specified pipe bedding material be considered satisfactory for this purpose.
2. If the Alternate Method of Construction is used, all embedment and backfill material, shall be carefully lifted into the trench and released to fall freely therein until the bucket or container is at or just above water level. Below the existing water level, and to a point not more than 18-inches above the water level, the backfill material shall be carefully placed into place in uniform layers, of equal depth on each side of the pipe. From a point not more than 18-inches above the water level, and below the pavement base or the surface of the ground if out of paving, backfill material shall be placed and compacted for normal backfilling as provided in "Installation of Backfill" and "Compaction and Densities".

3.11 RESTORATION OF EXISTING SURFACES

Paved and grassed areas disturbed by the operations required under this Section shall be restored as indicated on the approved Plans and/or specified herein.

END OF SECTION

SECTION 02505**CLEANING AND TESTING OF MAIN****PART 1. GENERAL****1.01 SCOPE OF WORK**

- A. The Contractor shall furnish all material, labor, and equipment necessary to clean and test the force main and/or water main.
- B. Pipelines for Potable Water Mains shall be pressure tested at 150 psi for a minimum of two (2) hours in accordance with Health Department requirements.
- C. Pipelines for Sewage Force mains shall be pressure tested at 100 psi for a minimum of two (2) hours.
- D. The Contractor is advised that he is solely responsible for any damage caused to the main or it's lining by cleaning operations, and he shall be required to repair or replace, as required by the Department, any damaged pipe or lining.
- E. Potable water mains shall be disinfected and approved for use by the Health Department prior to placing the main in operation.

1.02 SUBMITTALS

- A. Prior to cleaning operations, submit in writing to the Engineer, the make, model, and characteristics of the pig to be used in cleaning operations.
- B. If the pig has not been previously approved for this use by the Department, the submittal shall be a formal shop drawing submittal for approval and accompanied by a letter signed by a responsible officer of the manufacturing firm specifically stating that the submitted item will not damage the lining or pipe and that it is suitable for cleaning pipe of the diameter and lining type utilized in the project.
- C. Single submittals may be made to qualify different types of pigs for different linings or sizes of pipe but only one manufacturer's products shall be included in a particular submittal.

1.03 QUALITY ASSURANCE

- A. Testing shall be in accordance with ANSI/AWWA Standard C-600, latest edition.
- B. Cleaning and testing shall be performed in strict accordance with these specifications.

- C. The Contractor is cautioned that Miami Dade County or other governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting or limiting the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches. The Contractor shall comply with all regulations of all governing agencies.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Pig for cleaning lines: Bare Swab No. 5B; density, 1 lb./ft.³; Knapp Polly Pig, Inc., 1209 Hardy Street, Houston, Texas 77020, 1-800-231-7205, or approved equal.

PART 3. EXECUTION

3.01 CLEANING

- A. As soon as the installation of each run of force main and/or water main is completed, and prior to installation of valves on the main in positions which would interfere with the cleaning operation, the line shall be cleaned by use of a pig with characteristics as specified above. The pig shall be driven through the line by water pressure and no cables, push rods or other mechanisms that might damage the pipe or lining shall be utilized in this operation.
- B. Thorough pigging will be required, and operations shall be sufficient to remove all deleterious materials left in the pipe by construction and shall meet the Engineer's approval. If required by the Department, pigging operations shall be scheduled to allow observation by the Department and no extra compensation will be allowed for such scheduling.
- C. The Contractor shall furnish and install all piping necessary to carry out pigging operations, dispose of water and debris from the operation, and shall exercise care to prevent any damage to the surrounding area and adjoining or adjacent properties. The Contractor shall furnish either a new or in new condition pig for cleaning operations and the Department reserves the right to reject the pig and require provision by the Contractor of a new replacement at no additional cost to the Department.
- D. The Contractor is required to install nightcaps, plugs or other devices acceptable to the Engineer at the open ends of the pipe installation at the end of the workday. This requirement shall apply to installations both above and below the water table.

3.02 TESTING

- A. The test pressure for potable water mains shall be 150 psi. The test pressure for sewage force mains shall be 100 psi.

- B. After the main has been cleaned to the satisfaction of the Engineer, any valves which could not be placed prior to pigging operations shall be installed using care to prevent entrance of deleterious materials into the cleaned main or valve body. Thereafter the main shall be tested between line valves unless otherwise specified or permitted by the Engineer. Corporation stops shall be installed prior to testing and shall be included in the test with no leak permitted.
- C. All fire hydrants, corporation stops, air release valves, flushing valves, and meter valves in the section being tested shall be opened and left open until water comes out of them, in order to remove as much air as possible from the line.
- D. The Contractor shall furnish and install all necessary pumps, piping, and fittings, including the corporation stop, to connect the section under test to the source of water. The test pump shall be a centrifugal or gear pump producing a steady pressure free of pulsation. Water from a fire hydrant shall be measured with a floating meter.
- E. The Contractor shall furnish and install all necessary pumps, piping, and fittings, including the corporation stops, to connect the section under test to the source of water. The test pump shall be a centrifugal or gear pump producing a steady pressure free of pulsation. The test pressure shall be maintained throughout the duration of the test. Unless otherwise permitted by the Engineer, no static testing will be allowed.
- F. All corporation stops in the section being tested shall be opened and left open until water comes out of them, in order that as much air as possible may be removed from the line. Water shall be pumped into the line through the meter up to the required pressure, and pumping shall be continued to maintain that pressure for a period of 2 hours, or such longer period as the Inspector requires to inspect the line for leaks. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain the specified leakage test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.
- G. Since the allowable leakage is defined in gallons per hour, testing shall be conducted in, at a minimum, two independent 1 hour test periods.
- H. The maximum allowable leakage for ductile iron mains shall be determined by the following formula from the ANSI/AWWA Standard C600 "Installation of Ductile-Iron Water Mains and Their Appurtenances", latest edition:

$$L = \frac{SD \text{ times the square root of } P}{148,000}$$

- 1. Where: L is the allowable leakage in gallons per hour;
S is the length of pipeline tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test, in pounds per square inch gage.

- I. No pipe installation will be accepted if the leakage is greater than that determined by the above requirements.
- J. The Contractor shall locate and repair all leaks until the leakage is reduced to the limits specified. The Contractor may use the leak detector belonging to the Department but shall reimburse the Department for the actual cost of the operation of the instrument by Department personnel. Any observed leaks or any obviously defective joints or pipes shall be repaired or replaced as directed by the Engineer, even though the total leakage is below that specified above.
- K. The tests and repairs shall be continued or repeated until the Engineer is assured that the leakage from the section of line under test is less than the amount specified.

END OF SECTION

SECTION 02733

LIFT STATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Furnishing, installation of equipment, and placing in operation a complete lift station and related appurtenances as indicated on drawings and specifications. Maintain until substantial completion of work.
- B. Related Sections:
 - 1. 02314 - Excavating, Backfilling, and Fill for Structural Facility and Utility System.
- C. SUBMITTALS: Submit the following before starting work:
 - 1. Shop drawings of all items.
 - 2. Six manuals and maintenance instructions.
 - 3. Test reports.
 - 4. Certificate of compliance for each shipment of materials.
- D. QUALITY ASSURANCE
 - 1. Work shall be performed according to drawings and specifications in a neat and accurate manner.
 - 2. Manufacturer's certificate of compliance or certified analysis, according to applicable standards, shall be required for shipment of materials.
 - 3. Applicable Standards: The requirements of the Miami-Dade County Department of Regulatory and Economic Resources (MD-RER).
- E. WARRANTY
 - 1. The Contractor shall warranty the complete installation for 1 year after substantial completion, including labor and materials.
 - 2. The manufacturers shall warranty lift station structure, including mechanical and electrical equipment supplied by the lift station manufacturer within the structure, to be free from defects in material and construction for 1 year after substantial completion.

1.02 STORAGE

- A. Materials stored on site shall be kept clean and free of foreign materials. Any damaged items shall be replaced at no additional cost to the Department.

PART 2 PRODUCTS

- A. Wet Well: The wet well shall be provided as indicated on drawings and shall be fiberglass reinforced polyester resin with a minimum 4-inch concrete ballast collar.

- B. Hatches: Aluminum water-tight hatch covers shall be used for the wet well and valve vault.
- C. Pumps: Submersible type specifically designed to handle raw, unscreened, sanitary domestic sewage. Pump performance shall follow the characteristics indicated on drawings.
- D. Motors: Wire for 1 phase, 60 hertz, (208) volts. Motors shall not be overloaded at design pump operating conditions or any head in pump operating range as indicated.
- E. Control Panel: Pump control panel shall contain, but not be limited to, the following:
 - 1. A NEMA Type 4X controller with dead front construction with padlock, shall be provided, complete with main and emergency circuit breaker mechanically interlocked, receptacle for emergency generator, sized as shown on drawings, lightning arrestor, (meter), motor starters with hand-off-automatic switches, (fusible disconnects), (circuit breakers), control transformers, mercury switch level controls, 120 volts duplex receptacle with GFI protection, overload relays and heaters for all three-phase, 24-volt control circuit, alarm bell and light with silence switch, all according to the National Electrical Code, 1999. Pump control panel shall be stainless steel, aluminum manufactured, or heavy-duty molded fiberglass, mounted as shown on drawings. Provide ground rod as shown on drawings.
 - 2. A high-low level alarm system shall also be part of this panel including relay, reset button, and a level switch to actuate an alarm should the level in the wet well reach a predetermined high or low water level. Provide float indication lights in panel and running time meter.
 - 3. Pump control panel shall be factory wired and tested for the following functions:
 - a. Low water cut-off.
 - b. High water alarm with red light.
 - c. Automatic alternation of pumps.
 - d. Automatic alternator override and alarm in case of lead pump failure.
 - 4. Final setting and testing of the mercury switch level control shall be the responsibility of the General Contractor.
- F. Piping:
 - 1. AWWA type, Polyvinyl Chloride (C-900) flanged piping and fittings shall be used in the discharge lines.
 - 2. Gate valves shall be flanged, IBBM, AWWA type.
 - 3. Check valves shall be flanged, IBBM, AWWA type.
- G. Wiring: All wiring in the main control panel, switch settings within the station, the connection between the buildings, and the junction box at the station shall be according to the National Electrical Code and as indicated on drawings.

PART 3 EXECUTION

3.01 FIELD INSTALLATION

- A. Comply with the requirements of 02314 - Excavating, Backfilling, and Fill for Structural Facility and Utility System.
- B. Set station plumb and to grade indicated.
- C. Field test station after installation for proper functioning to demonstrate proper functioning and operation.
- D. Place lift station in full service to satisfaction of the Department, MD-RER and Engineer.
- E. Instruct the Department as to lift station operation and maintenance details.

3.02 FIELD QUALITY CONTROL

- A. Tests: Cost of tests shall be at the expense of the Contractor.

END OF SECTION

SECTION 02900**LANDSCAPING****PART 1 - GENERAL****1.01 SCOPE OF WORK:**

- A. Work included in this Section includes tree removal, tree relocations, furnishing and planting trees, plants and grass of the species, sizes and quality specified, fertilizing, watering, maintaining plants, guarantee and obtaining all permits from municipalities having jurisdiction over this work.
- B. The schedule of trees and plants, if applicable, is shown on the drawing, and indicates the common and botanical names, the quantities, and sizes of plants to be used.
- C. Plants shall be sound, healthy, and vigorous, well branched, and densely foliated when in leaf with well-developed root systems free of disease and insects, pests, eggs or larvae. No plants will be accepted unless healthy and showing satisfactory foliage conditions.

1.02 Solid sod and grass submittal to be submitted to the Engineer or Record for approval prior to installation.

PART 2 - PRODUCTS**2.01 GRASSING, SOLID SOD AND SEED:****A. General:**

- 1) Solid sod shall be planted in the unpaved areas abutting the structures and extending to the limits shown on the Plans.
- 2) Grass seeding: All other unpaved areas shall be planted with grass seed and mulched.
- 3) When solid sod or grass seed is to be placed adjacent to or in close proximity to existing sod or grass, the Contractor is to use similar sod or grass and obtain approval from the Engineer of Record prior to installation. In public areas and right-of-ways the Contractor is also required to comply with Governmental Agency requirements and provide the Department with written approval of said agency prior to installation of grass and sod.

B. Materials:

- 1) Solid Sod:
 - (a) Solid sod shall be certified bitter blue St. Augustine Floratam. The sod shall be firm touch texture having a compact growth of grass with good root

development. It shall contain no weeds or other objectionable vegetation.

- (b) The soil embedded in the sod shall be good clean earth, free from stones and other debris. The sod shall be free from fungus, vermin, and other diseases. The sod and soil shall be approximately 2" thick.
 - (c) Before being cut and lifted, the sod shall have been mowed at least three times with a lawn mower, with the final mowing not more than seven days before the sod is cut. The sod shall be cut into uniform dimensions approximately 12" X 24". Abutting joints shall be free of open spaces with a tamped or rolled surface so that there are no joint openings.
- 2) Topsoil: Soil utilized for planting grasses shall be a mixture of pulverized 50% rock free siliceous sand and 50% clean mulch from an approved source. All ingredients shall be free of sticks, roots, rocks, lumps or other impurities or debris. All soil shall be delivered in a loose friable condition. Topsoil may be "unsuitable topsoil" removed during the course of other work hereunder, if approved by the Engineer of Record. Topsoil shall be free of undesirable plants and seeds. Any such plants sprouting from areas of recent topsoil application shall be presumed to have originated in the topsoil and shall be eradicated from the area by the Contractor at his expense. Means of eradication shall be submitted to the Engineer of Record for approval.

C. Planting of Grassing:

- 1) Solid Sod: Unless otherwise directed by the Engineer, four inches of topsoil shall be placed. The ground area shall be saturated with water. Sod shall be placed on the graded and watered ground firmly butted on all sides by sod without leaving holes, slots, or depressions. Sod shall be top dressed with soil (herein before specified) where required to bring all fill to voids and provide a uniform grass matt if approved by the Engineer of Record. Soil shall firmly abut all structures to which it surrounds or contacts. Immediately after the grassing process, the entire grassed or mulched area shall be rolled thoroughly with a cultipacker traffic approved roller, or other 1,000-pound roller. At least two trips over the entire area will be required.
- 2) Grass Seeding: As above, place four inches of topsoil and saturate with water. Thereafter seed and mulch

D. Fertilizing Grassing:

- 1) Commercial fertilizers shall comply with all Federal, State and County fertilizer laws.
- 2) The numeral designations for fertilizer indicate the minimum percentage (respectively) of (1) total nitrogen, (2) available phosphoric acid, and (3) water soluble potash, contained in the fertilizer.
- 3) Designations may be approved specifically for a particular project and if liquid fertilizer other than that of chemical designation 8-8-8 is used, the total nitrogen content shall not exceed 12 percent.

- 4) At the Contractor's option liquid or dry fertilizer may be used. All grass shall be fertilized and watered in during the planting operation using the application rate and method directed by the manufacturer of the fertilizer used.

E. Guarantee and Maintenance of Grassing:

1) Guarantee:

- (a) The Contractor shall guarantee all grasses for a period of six months from the date of acceptance of the completed overall project from the Contractor.
- (b) The Contractor shall guarantee the grasses shall be alive, free of disease and have a healthy appearance at the end of the guarantee period.
- (c) During the guarantee period, the Contractor shall replace any grass which is diseased, dead, or visually unsightly within 3 days when requested in writing.

2) Maintenance:

- (a) The Contractor shall maintain all grass guaranteed above for the period of the guarantee. Such maintenance shall include filling, leveling, and re-planting eroded areas, replanting areas where the establishment of the grass does not develop satisfactorily, and watering as required. In no case shall such maintenance be less than 3 weeks for watering and 6 weeks for remaining maintenance care.
- (b) The maintenance of the grass shall include, regular mowing, one application of approved dry or liquid fertilizer to the grasses guaranteed above. The fertilizer shall be applied and watered in as directed by the manufacturer. The time of fertilizing shall be approved.
- (c) The Contractor shall be required under the maintenance of the guaranteed grasses to safeguard and take all possible precautions against damage from the elements and other possible damage. The Contractor shall be required to clean up the effected landscape area during the maintenance period due to any such event. The Contractor shall not be responsible to replace grasses properly protected under this item of the specifications, damaged by the events beyond his control.

2.02 PLANTS AND TREES: (If required by relocation and if shown on the drawings)

A. Grade Standards and Quality:

- 1) Quality of all plants shall be at least equal to that defined as No. 1 by the State Plant Board of Florida in Grades and Standards for Nursery Plants, Part I, 1963 Revised Edition, and Part II, Palms and Trees.
- 2) All plants shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf. They shall have healthy, well developed root systems and shall be free of disease and insect pests, eggs, or larvae.
- 3) No plants will be accepted unless they are healthy and show satisfactory foliage conditions.

- 4) All plants shall conform to the measurements specified or indicated on the Drawings except that up to 10 percent of undersized plants in any one variety or grade may be used provided there are sufficient oversized plants to make the average equal to or above specified grade. Plants larger than specified may be used if approved by the Engineer of Record, but use of such plants shall not increase the Contract price. The spread of roots or ball of earth for larger plants shall be increased in proportion to the size of the plant.
- B. Plant Designation: With reference to method of cultivation, root system status, etc., plants for landscaping shall be classified under the following designations:
- 1) Balled and Burlapped:
 - (a) Plants so classified shall be dug with firm natural root balls of earth, of sufficient diameter and depth to include most of the fibrous roots. The root ball of these plants shall be properly wrapped with burlap sack material and remain protected and moist until they are planted. Plants whose burlapped balls have cracked or become sagging, or plants showing scars from rope and cable marks, or other improper handling are not acceptable. All balled and burlapped plants which cannot be planted immediately upon delivery shall be set on the ground and shall be well protected with soil, wet moss, or other acceptable material. The plants shall be set with the burlap cover intact and with the burlap showing, until inspection. At final inspection, the burlap may be cut away to ground level and completely covered with soil.
 - (b) It is required that, balled and burlapped materials, 1½ inches or more in caliper, shall be root-pruned at least 45 days before being dug and such fact shall be certified on accompanying invoices. Where, in the opinion of the Engineer of Record following his inspection of the grower's stock, adequate root pruning is being obtained by the grower's general cultivating practices, he may consider such fact as meeting this requirement.
 - 2) Wire Balled and Burlapped:
 - (a) Plants grown in soil of a loose texture which does not readily adhere to the root system shall have sound hog wire placed around the burlapped ball before the plant is removed from the excavation. The wire shall be looped and tensioned until the burlapped ball is substantially packaged so as to prevent loosening of the soil around the roots during handling.
 - (b) Wire balled and burlapped plants shall otherwise comply with the requirements for balled and burlapped plants described in 1 above.
 - 3) Container Grown Plants:
 - (a) Container grown plants shall have been grown in a container large enough and for sufficient time for the root system to have developed well enough to hold its soil together firm and whole. No plants shall be loose in the container. Plants which have become pot bound or for which the top system is too large for the size of the container, will not be acceptable.
 - (b) All containers with vertical sides shall be cut and opened fully, in a manner

such as will not damage the root system. Container grown plants shall not be removed from the container until immediately before planting, when all due care shall be taken to prevent damage to the root system.

- 4) Bare-Root Plants: No bare-root plants shall be used unless specifically required by the Engineer of Record or called for on the drawings.
- 5) Palms:
 - a) Palm species shall have the roots adequately wrapped before transplanting except when they are container grown. Burlapping will not be required if the palm is carefully dug from marl or heavy soil that it adheres to the roots and retains its shape without crumbling. During transporting and after arrival, root balls of palm shall be carefully protected from the wind and exposure to the sun. After delivery to the job site, if palm is not planted within 24 hours, the root ball shall be covered with a moist material.
 - b) All moving of sabal, coconut and royal palms shall be in accordance with Heavy Trunk Palms, as described in "Florida Grades and Standards for Nursery Plants, Part II".
- 6) Rooted Cuttings: Cuttings shall be kept moist at all times. They shall be rooted in a medium other than wood shavings and have at least 4 root tips of ½-inch or longer.

C. Transportation and Inspection:

- 1) Plant transportation shall comply with all Federal and State regulations therefor and, upon delivery at the site, all plants shall be inspected for conformity to specifications and for handling damage. Rejected plants shall be removed immediately from the site by the Contractor.
- 2) Foliage trees when moved in full leaf shall be treated with "Wilt Pruf" or "Plantguard", as they are loaded at their growing site. This material shall be applied to the entire tree with a fine spray at a dilution of 1 part "Wilt Pruf" or "Plantguard" to 15 parts of water.
- 3) Trees which have to be transported in excess of 10 miles to reach the job site, shall be covered with a 70 percent shade-cloth-tarp, or equal in order to prevent wind burn.
- 4) Immediately following the delivery and inspection at the job, all plants with exposed roots shall be heeled-in moist soil or peat moss. All plants heeled-in shall be properly maintained by the Contractor until planted.
- 5) The balls of balled and burlap plants, must, if not immediately planted after delivery and inspection, be adequately protected by covering until removed for planting, in a manner appropriate to prevailing conditions and in accordance with accepted horticultural practices. The Contractor shall, in loading, unloading, or handling of plants, exercise utmost care to prevent injuries to the branches or roots of the plants. The solidity of the ball of balled and burlapped plants shall be carefully preserved. Handling of the plant by parts other than the ball shall be cause for

rejection of such plant. Bare root plants which have been heeled-in shall be properly handled during the distribution of planting beds.

D. Planting Materials:

- 1) Planting Soil: Planting soil shall be a pulverized mixture of 50% rock free siliceous sand and 50% clean mulch from an approved source. All ingredients shall be free of sticks, roots, rocks, lumps, or other impurities or debris. All soil shall be delivered in a loose friable condition.
- 2) Fertilizer:
 - (a) Fertilizer shall be as specified in subsection 2.01-D, herein.
 - (b) Fertilizer shall be selected and used as recommended by the manufacturer for each particular plant.
- 3) Mulch: Mulch shall be ground bark, bark peelings, peat, hay, or straw. Cypress mulch shall not be used because its harvest degrades cypress wetlands.
- 4) Anti-Desiccant: Anti-desiccant shall be "Wilt Pruf", "Plantguard", or equal, delivered in the manufacturer's containers and used in accordance with the manufacturer's instructions.
- 5) Water:
 - (a) Water for the irrigation of the new plantings during the progress of construction shall be provided by the Contractor in accordance with the provisions previously specified.
 - (b) The Contractor shall furnish adequate watering equipment and shall continue watering to properly establish the new plantings throughout the maintenance period.
- 6) Wire: Wire for the bracing and guying shall be pliable No. 12 or No. 14 gauge galvanized soft steel wire.
- 7) Stakes and Ties: Stakes and ties shall be provided in accordance with the requirements of PART 3 EXECUTION, below.

PART 3 - EXECUTION

3.01 EXCAVATION OF PLANT HOLES:

- A. Plant hole excavations shall be roughly cylindrical in shape, with the sides approximately vertical. Plants shall be centered in the hole, with the trunk location as shown in the Plans.
- B. Bottoms of the holes shall be loosened at least 6-inches deeper than the required depth of excavation.

- C. Holes for balled and burlapped and wire balled and burlapped plants shall be large enough to allow at least 8-inches of backfill around the earth ball. For root balls over 18-inches in diameter, this dimension shall be increased to 12-inches.
- D. Where excess material has been excavated from the plant hole, the excavated material shall be disposed of as and where directed by the Engineer of Record.
- E. PREPARATION OF GROUND
 - 1) Four inches minimum thickness of topsoil shall be placed over the areas off the right of way on which the sod is to be placed.
- F. APPLICATION OF FERTILIZER
 - 1) Before applying fertilizer, the soil pH shall be brought to a minimum range of 6.0 - 7.0.
 - 2) The fertilizer shall be spread uniformly over the area to be sodded at the rate of 500 pounds per acre, by a spreading device capable of uniformly distributing the material at the specified rate. Immediately after spreading, the fertilizer shall be mixed with the soil to a depth of approximately 4-inches.
 - 3) On steep slopes, where the use of a machine for spreading or mixing is not practicable, the fertilizer shall be spread by hand and raked in and thoroughly mixed with the soil to a depth of approximately 2-inches.
- G. PLACING SOD
 - 1) The sod shall be placed on the prepared surface, with edges in close contact and shall be firmly and smoothly embedded by light tamping with appropriate tools. Sod areas abutting concrete, asphalt or other applicable surfaces shall have the soil depressed at edges of the pavements so that the cut grass does not protrude over 2-inches above the adjacent property.
 - 2) Where sodding is used in drainage ditches, the setting of the pieces shall be staggered so as to avoid a continuous seam along the line of flow. Along the edges of such staggered areas, the offsets of individual strips shall not exceed 6-inches. In order to prevent erosion caused by vertical edges at the outer limits, the outer pieces of sod shall be tamped so as to produce a featheredge effect.
 - 3) On steep slopes, the Contractor shall, if so directed by the Engineer of Record, prevent the sod from sliding by means of wooden pegs driven through the sod blocks into firm earth, at suitable intervals.
 - 4) Sod which has been cut for more than 72 hours shall not be used unless specifically authorized by the Engineer of Record after his inspection thereof. Sod which is not planted within 24 hours after cutting shall be stacked in an approved manner and maintained and properly moistened. Any pieces of sod which, after placing, show an appearance of extreme dryness shall be removed and replaced by fresh, uninjured pieces.

- 5) Sodding shall not be performed when weather and soil conditions are, in the Engineer of Record's opinion, unsuitable for proper results.

H. WATERING

- 1) The areas on which the sod is to be placed shall contain sufficient moisture, as determined by the Engineer of Record, for optimum results. After being placed, the sod shall be kept in a moist condition to the full depth of the rooting zone for at least 2 weeks. Thereafter, the Contractor shall apply water as needed until the sod roots and starts to grow for a minimum of 60 days (or until final acceptance whichever is latest).

3.02 UNDERGROUND OBSTRUCTIONS:

- A. In the event that rock, underground construction work, utility lines or obstructions out of the ordinary are encountered in any plant hole excavation, alternative locations will be selected by the Engineer of Record.
- B. Where locations cannot be changed and the obstructions may be removed, the obstructions shall be removed to a depth of not less than 3-feet below grade and not less than 6-inches below bottom of balls or roots when plant is properly set at the required grade.

3.03 SETTING OF PLANTS:

- A. When lowered into the hole, the plant shall rest on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance. The Contractor, when setting plants in holes, shall make allowances for any anticipated settling of the plants.
- B. The backfill shall be made with planting mixture as specified hereinbefore and shall be firmly rodded and watered-in, so that no air pockets remain. The quantity of water applied immediately upon planting shall be sufficient to thoroughly moisten all the backfilled earth. Plants shall be kept in a moistened condition for the duration of the Contract.

3.04 STAKING AND GUYING:

- A. When called for on the Drawings or directed by the Department, plants shall be staked in accordance with the following provisions:
 - 1) Small Trees: For trees and shrubs of less than 1-inch caliper, the size of stakes and the method of tying shall be such as to rigidly support the staked plant against damage caused by wind action or other effects. Trees larger than 1-inch and smaller than 1½ inch caliper shall be staked with a 2-inch square stake driven at least 24-inches in the ground and extending to the crown of the plant. The plant shall be firmly fastened to the stake with two strands of 14-gauge soft wire, enclosed in rubber hose, or other approved covering. The wire shall then be nailed or stapled to the stake to prevent slippage.

- 2) Medium Trees: All trees, other than palm trees, larger than 1½-inch caliper and smaller than 2½-inch caliper shall be staked with two or more, 2-inch by 2-inch stakes, 8-feet long, set 2-feet in the ground. The tree shall be midway between the stakes and held firmly in place by two strands of 12-gauge wire, applied as specified above for single stakes. Tie wires shall be tightened and kept tight by twisting.
- 3) Large Trees: All trees, other than palm trees, larger than 2½-inch caliper, shall be guyed from at least 3 points with double strands of 12-gauge wire. Guy wires shall be anchored to 2-inch by 4-inch stakes, 24-inches long, driven into the ground at least 2-feet and sufficient that the top of the stake is at least 3 inches below the finished ground level. In firm rock soils, No. 4 steel reinforcing rods or ½-inch pipe may be used instead of 2 by 4's. Tie wires shall be securely fastened to the tree by means of a collar of rubber hose, or other approved material. Guy wires shall be tightened and kept tight by twisting.
- 4) Palm Trees: Brace palm trees with three or more 2-inch by 4-inch wood braces, toenailed to cleats which are securely banded at two points to the palm, at a point at least 6-feet above the ground. The trunk shall be padded with five layers of burlap under the cleats. Braces shall be approximately equidistantly spaced and secured underground with 2-inch by 4-inch by 24-inch stake pads. In firm rocky soils, No. 4 steel reinforcing rods or ½-inch pipe is acceptable.

3.05 PRUNING:

All broken or damaged roots shall be cut off smoothly and the tops of all trees shall be pruned in a manner complying with standard horticultural practice. At the time pruning is completed, all remaining wood shall be alive. All cut surfaces of 1-inch or more in diameter, above the ground, shall be treated with an approved commercial tree paint.

3.06 MULCHING:

Within one week after the planting, mulch material, approved by the Engineer of Record, shall be uniformly applied to a minimum thickness of 2-inches, over the entire area of the backfilled hole or bed. The mulch shall be maintained continuously in place until the time of final inspection. Mulch is not required if other ground surface covers, such as rooted cuttings are called in the Plans.

3.07 INSPECTION:

On completion of the work, the Engineer of Record will inspect all planting work. The Contractor shall repair or replace all defective work, whichever is unsatisfactory to the Engineer of Record or the Department. Preliminary acceptance of all plant materials will be given only after the materials are planted and after meeting all requirements prescribed herein.

3.08 MAINTENANCE:

- A. Maintenance shall begin immediately after each plant is planted and shall continue until

all work under this Contract has been completed and final acceptance is obtained from the Department, however, the minimum period of this maintenance shall not be less than 60 days even if it extends beyond final acceptance of contract. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected. Settled plants shall be reset to proper grade position, planting saucer restored, and dead material removed. Guys shall be tightened and repaired.

- B. Defective work shall be corrected as soon as possible after it becomes apparent. Upon completion of planting, the Contractor shall remove from the site excess soil and debris, and repair any damage to structures, etc., resulting from planting operations.

3.09 GUARANTEE:

The Contractor shall guarantee all planting work for a period of six months after the date of final acceptance. During the guarantee period, the Contractor shall replace at no cost to the Department any plant that dies or is not established within the guarantee period. Any plants missing or defective shall be furnished or replaced in a manner satisfactory to the Department.

END OF SECTION

SECTION 15060**PIPING AND FITTINGS****PART 1 - GENERAL****1.01 SCOPE:**

- A. This section describes materials, testing, and installation of ductile-iron pipe and fittings for water and sewer mains, small diameter Poly Vinyl Chloride Pipe (PVC) with threaded, flanged and solvent cemented joints; Copper Pipe and Fittings, and High Density Polyethylene Pipe for water services. The work included in this section consists of furnishing all material, equipment, craft labor and performing all operations necessary for the supply, installation, and commissioning of all piping, fittings and accessories within the limits of work, as shown on the drawings and specified herein.
- B. Where references are made to other standards or codes, unless specific date references are indicated the latest edition of said standard or code shall govern.

1.02 WORK NOT INCLUDED UNDER THIS SECTION:

Piping installation for various types of piping systems is specified other sections herein that constitute MDWASD's Design Standards and Construction Details. Installations specified in this section are supplementary to those sections and in the case of conflict the more stringent condition shall prevail. For type PSM SDR-35, 26 PVC and AWWA C900 PVC sewer pipe and fittings see Section UC-250, "Gravity Sewer Systems".

1.03 RELATED SECTIONS:

- A. Section 15010 - Basic Mechanical Requirements
- B. Section 15065 - Miscellaneous Materials
- C. Section 15070 - Jacking and Boring
- D. Section 15075 - Aerial Crossings
- E. Section UC-250 - Gravity Sewer Systems
- F. All sections specifying various types of valves.

1.04 PIPING LAYOUT AND DESIGN CRITERIA:

- A. Field verify dimensions prior to preparation of layout and shop drawings. Obtain the following information from the drawings and specifications:
 - 1. Elevation of the pipe centerline and of the completed ground.
 - 2. Alignment of the pipeline.
 - 3. Field test hydraulic gradient elevation (HGL).
 - 4. Nominal internal diameter, ID.
 - 5. Design internal pressure class or HGL
 - 6. Joint types.

- B. Obtain shop drawing approval prior to fabrication of piping. All items not specifically mentioned in the Specifications or noted on the approved Plans, but which are reasonably necessary to for a complete, functional, and satisfactory installation shall be included.

1.05 SUBMITTALS

- A. Submit shop drawings in accordance with the General Provisions.
- B. Provide an affidavit of compliance with standards referenced in this specification, e.g., AWWA C151, AWWA C153, etc.
- C. Submit copy of report of pressure tests for qualifying the designs of all sizes and types of pipe and fittings that are being used in the project. The pressure test shall demonstrate that the minimum safety factor described in relevant standard is met.
- D. Submit piping layout profile drawings showing location and dimensions of pipe and fittings; submit after equipment and valve submittals have been reviewed and marked **"Resubmittal not required."** Include laying lengths of valves, meters, in-line pumps, and other equipment determining piping dimensions. Label or number each fitting or piece of pipe. Piping having identical design pressure class, laying lengths, and bell-and-spigot dimensions that is to be placed in long straight reaches of alignment may have the same identifying label or number.
- E. Provide the following information:
 - 1. Mortar lining thickness.
 - 2. Wall thickness.
 - 3. Material test data for this project.
 - 4. Show deflections at push-on and mechanical joints.
 - 5. Submit joint and fitting details and manufacturer's data sheets.
- F. Fully detailed drawings of all fittings proposed shall be supplied by the manufacturer with his bid. The tabulated nominal weight of each size and type of fitting shall also be supplied by the manufacturer for all items proposed. This weight shall be that of the bare casting prior to application of any lining or coating.
- G. Submit calculations and test data proving that the proposed restrained joint arrangement for restrained joint pipe can transmit the required forces with a minimum safety factor of 1.5.
- H. Submit copy of manufacturer's quality control check of pipe material and production. Include hydrostatic test records and acceptance test records. For each acceptance test, submit a stress-strain diagram showing yield strength, yield point, tensile strength, elongation, and reduction in area. Provide specimen test section dimensions and speed and method used to determine speed of testing, method used for rounding of test results, and reasons for replacement specimens, if any. Submit ring-bending test of pipe of the same diameter and pressure class as the pipe required for this project to prove ring-bending stress at 48 ksi results in a factor of safety of 2.0.
- I. For Ductile Iron Pipe and fittings, submit certificate that cement for mortar lining complies with ASTM C150, designating type.

- J. Submit test report on physical properties of rubber compound used in the gaskets.
- K. Submit test reports and certifications for ceramic epoxy lining as specified herein. Submit applicators qualifications. Submit manufacturer's written recommendations for application and repair of coating.
- L. Submit drawing or manufacturer's data sheet showing flange facing, including design of facing serrations.
- M. Submit weld procedure specification, procedure qualification record, and welder's qualifications prior to any welding to ductile-iron pipe or fittings.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. During shipping, delivery and installation of pipe and accessories, handle in a manner that is in compliance with the manufacturer's recommendations, and employ procedures that ensure delivery of an undamaged operable product
- B. Exercise particular care not to damage coatings by limiting exposure or physical contact with other materials, objects, or the environment.

1.07 INSPECTION

The Owner's Representative will inspect materials, production, and testing of pipes, fittings, and special pieces at manufacturer's plant.

1.08 QUALITY ASSURANCE

All pipe, fittings and other materials supplied under this contract shall be subject to inspection while still on the delivery truck. It is the sole responsibility of the vendor and supplier to make prior contact with the Storekeeper or the Construction Management section and provide a minimum of 48-hours prior notice of delivery. When so notified, the Department will make arrangements for inspection of the material upon arrival or within a reasonable time thereafter. Material shall not be unloaded without inspections taking place either prior to or, if necessary for examination, during the unloading procedure. The Department will not be responsible for any delays or additional costs created by non-compliance with the requirement for prior notification or the requirement for thorough inspection.

Materials shall be delivered in complete compliance with the AWWA Standards as modified herein, without damage, and shall match or exceed the quality of any samples supplied. The Department absolutely reserves the right to require samples of any material supplied and to perform whatever tests considered by the Engineer, whose decision shall be final, to be in the Department's best interest on said samples. Where such tests are of a destructive nature, the sample, if it passes the test will be paid for (at cost as shown by invoice) by the Department. Samples failing will be immediately replaced with suitable material at the supplier's/contractor's expense. Samples required prior to order as a condition for purchase or as a materials submittal for approval will be at the supplier's/contractor's expense but, if approved and not used for destructive tests, may be used in the work with permission from the Engineer.

Materials found to be defective, not in strict compliance with the quality standards of samples

supplied or these specifications shall be immediately returned to the vendor at his expense. If defects are discovered at a later time, the vendor shall be required to remove said items and shall bare all costs for so doing together with any replacement costs. Rejection of items may subject the vendor to liquidated and/or actual damages as specified elsewhere herein.

Foundries supplying materials shall maintain their metallurgical records for a minimum period of two years after fabrication and firms not doing so may be found in default.

Flaws which provide cause for rejection include;

1. Incorrect metallurgy or metallurgy which cannot be verified to the complete satisfaction of the Engineer;
2. Foundry identification/location, size, pressure and material identification information lost, removed, non-existent, or not visible when assembled;
3. Not in complete compliance with all applicable AWWA Standards as modified herein and/or these specifications;
4. Not in compliance with NSF;
5. Not in compliance with approved shop drawings;
6. Out of roundness in excess of AWWA requirements;
7. Dimensional differences in excess of AWWA requirements;
8. Rough exterior coating;
9. Chipped, cracked, scratched or otherwise damaged interior or exterior coatings or linings;
10. Interior or exterior coatings which are too thin;
11. Coatings too thick to allow proper assembly; coatings too thick to allow proper grip by restraining gaskets or other restraining elements;
12. Pin holes or honey combing of pipe;
13. Weld spatter or excess metal in gasket grooves or the whole of the bell area;
14. Bell areas which are distorted or otherwise improperly cast;
15. Spigots which are out of round, not of proper dimension, or not beveled to an extent that will allow easy assembly of the pipe joint;
16. Gaskets which are defective or of the wrong material;
17. Lack of joint materials;
18. Improper or defective joint materials;

19. Bolting of the wrong material or size;
20. Electro galvanizing or other exterior plating when hot-dip galvanizing is required;
21. Incorrect, flawed or damaged interior coating or lining;
22. Lack or non-submittal of all required certifications;
23. Non-timely submission of certifications; incorrect/incomplete certifications or certifications lacking the signature, date and seal of a professional engineer when so required;
24. Flanges which are too thin, not a right angles to the pipe centerline, or otherwise distorted;
25. The above listed items together with all other flaws or defects which in the opinion of the Engineer, whose decision shall be final, adversely affect the assembly and/or function of the piping system as intended.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS: DUCTILE IRON

A. GENERAL

As used herein, "ANSI" denotes the American National Standards Institute, "AWWA" denotes the American Water Works Association, and "ASTM" denotes the American Society for Testing and Materials.

All pipe and fittings to be furnished hereunder shall conform to the referenced ANSI and/or AWWA Standard as modified herein, as appearing in the following sections.

All markings required on pipe and fittings, shall be permanent and clearly legible and located such that they will not be hidden or destroyed when assembled into the intended system. Plainly mark each length of straight pipe and each fitting at the bell end to identify the design pressure class, the wall thickness, and the date of manufacture, and the proper location of the pipe item by reference to the layout schedule. Mark the spigot end of restrained joint pipe to show clearly the required depth of insertion into the bell.

B. DUCTILE IRON PIPE

All pipes shall be ductile iron pipe conforming to ANSI/AWWA Standard C151/A21.51-09, "Ductile-Iron Pipe, Centrifugally Cast, for Water". All pipe and fittings for water applications shall be in full compliance with ANSI/NSF 61, "Drinking Water System Components-Health Effects". Manufacturers shall maintain their NSF certification for the duration of the Contract and any extensions thereof.

The pipe thickness and outside diameter of pipe for sanitary sewer and water usage shall conform to Tables 1 and 2 (for push-on and mechanical joint pipe, respectively) of ANSI/AWWA Standard C151/A21.51-09 for the following sizes. The pressure class specified is the minimum permitted:

Size	Pressure Class
4-inch through 12-inch	350
14-inch through 20-inch	250
24-inch	200
30-inch through 54-inch	150

For restrained joint pipe, the thickness of the pipe barrel remaining after grooves are cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained joint pipe as shown above.

Minimum wall thickness for pipe having threaded flanges shall be Special Class 53 or Pressure Class 350.

Minimum pipe wall thickness required for corporation stops and tapped outlets shall be in accordance with Table A.1 of ANSI/AWWA C151/A21.51-09 for three full threads for design pressures up to 250 psi and four full threads for design pressures over 250 to 350 psi.

For flanged ductile-iron pipe with integrally cast flanges or threaded flanges, the nominal wall thickness of the pipe barrel shall be as specified in Section 3.3, "Joints and Accessories" under "Flanged Joints", herein below.

Minimum wall thicknesses for pipe having grooved-end joints shall be as shown in the following table:

DI Pipe and Fitting Sizes (inches)	Grooved End Joint Wall Thickness*
16 and smaller	Special Class 53
18	Special Class 54
20	Special Class 55
24 to 36	Special Class 56
42 and larger	Special Class 53 or Pressure Class 350
*Special Class and Pressure Class per AWWA C151-09.	

Each piece of pipe shall be marked as required in Subsection 4.7 of AWWA C151-09. Letters and numerals on pipe sizes 12-inch and smaller shall be not less than 3/8-inch.

The Water and Sewer Department absolutely reserves the right to require the use of "thickness" class pipe or higher pressure class pipe in applications where in the opinion of the Engineer (i.e. the Chief, Engineering Division, M-D WASD or his representative) such use is in the best interest of the Department. The Engineer's decision in this regard shall be final.

A sufficient quantity of non-toxic vegetable soap lubricant shall be supplied with each shipment of pipe. The soap lubricant shall be suitable for use in subaqueous trench conditions.

Single gasket push-on pipe shall be shipped in standard 18-foot or 20-foot lengths, but not

both. Restrained single-gasket push-on joint pipe shall be shipped in standard 18 or 20-foot lengths as specified above or fabricated lengths as noted in each order. At least two lengths of each size of single gasket push-on pipe furnished under each order shall be tested with circumferential gauges to ensure that the pipe may be cut at any point along its length and have an outside diameter which will be within the manufacturer's standard design dimensions and tolerances for plain pipe. These lengths shall be identified with an easily distinguished, painted marking, longitudinally along the full length of the pipe.

C. GASKETS

Water Mains shall use SBR gaskets for typical applications and field conditions. Gaskets constructed of EPDM, Nitrile are used in areas where geotechnical information indicates the presence of moderate contamination is possible. All water mains shall use gaskets material with NSF 61 approval.

Sewer Mains shall use Neoprene or EPDM gaskets for typical applications and field conditions.

Areas with chemical or hydrocarbon contamination shall use the gasket material as recommended by the Ductile Iron Pipe Research Association (dipra.org) or the gasket manufacturer.

D. FITTINGS

Fittings Conforming to ANSI/AWWA C110/A21.11-12 (Water & Sewer Use)

Restrained push-on joint fittings shall be cast ductile iron for use with ductile-iron pipe as specified above. Standard mechanical joint, push-on joint and flanged joint fittings shall also be ductile iron for use with ductile-iron pipe as specified above. Cast ductile-iron fittings in the 3-inch through 24-inch size range shall be pressure rated at 350 psi, minimum; (except flange-joint fittings shall be rated at 250 psi, minimum); and in the 30-inch through 54-inch size range shall be pressure rated at 250 psi, minimum. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C110/A21.10-12, "Ductile-Iron and Gray-Iron Fittings ". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-12, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings".

The weight of fittings shall be as given in ANSI/AWWA C110/A21.11-12 for ductile-iron fittings. The weight of mechanical joint fittings shall be as established in Tables 4 through 13. The weight of flanged joint fittings shall as established in Tables 14 through 21.

Fittings Conforming to ANSI/AWWA C153/A21.53-11 (Water & Sewer Use)

All fittings shall be cast ductile-iron for use with ductile-iron pipe as specified above. Fittings in the 3-inch through 24-inch size range shall be pressure rated at 350 psi, minimum; 30-inch through 48-inch size range shall be pressure rated at 250 psi, minimum; and in the 54-inch through 64-inch size range shall be pressure rated at 150 psi, minimum (except for those fittings such as plugs, caps, and sleeves which are normally rated at a higher pressure). No flanged fittings or mixtures of flanged with other end type fittings will be allowed in the range of 3-inch through 48-inch. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C153/A21.53-11, "Ductile-Iron Compact Fittings ". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA

Standard C111/A21.11-12, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings" except as otherwise allowed in C153. Mechanical joint glands shall be ductile-iron only.

The weight of a fitting supplied under the contract shall not be less than ninety-five (95) percent of the tabulated nominal weight supplied by the manufacturer's catalog literature for that fitting. Further, the weight of fittings supplied shall not be more than five (5) percent above the same tabulated nominal weight.

E. JOINTS AND ACCESSORIES

Joints in below-ground piping shall be flexible push-on or Mechanical joints, except where flanged joints are required to connect to valves, meters, and other equipment. Provide unrestrained buried joints except where restrained joints are specifically shown in the drawings. Joints in aboveground or submerged piping or piping located in vaults and structures shall be grooved end or flanged.

Restrained joints for piping 6 inches and larger shall be American Cast Iron Pipe "Lok-Ring" or "Flex-Ring," U.S. Pipe "TR-Flex," or equal. Weldments for restrained joints shall be tested by the liquid penetrant method per ASTM E165. Restrained joints for field closures shall be "Megalug" by EBAA Iron.

Push-On Type Joints (Single Gasket and Single Gasket with Gasket Restraint)

Push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-12.

The required number of gaskets for each push-on joint pipe plus one extra for every 50 joints or fraction thereof, shall be furnished with each order. The gaskets shall be shipped in suitable protective containers. All single gasket pipe shall be as manufactured by United States Pipe and Foundry Company (Tyton), by the American Cast Iron Pipe Company (Amarillo Fastite), by McWane, Inc. (Mix of Tyton and Fastite), Tyler/Union (Tyton) or approved equal.

Push-on joints together with both their regular and gasket-restraint gaskets shall be of the design, dimensions and tolerances of either those provided by American Cast Iron Pipe Company (Amarillo Fastite/Fast-Grip) or those provided by United States Pipe and Foundry Company (Tyton/Field Lok). No other designs will be acceptable.

The pressure rating shall be stamped on the restrained gasket. The restrained gasket and joint restraining system shall conform to ANSI/AWWA Standard C111/A21.11-12 rated at the following:

Size	Pressure Rating (Min.)
4-inch through 12-inch	350
14-inch through 20-inch	250
24-inch	200
30-inch and above	150

The restrained gasket shall be manufactured a color other than black to allow for visual inspection of the pipeline. The restrained gasket color shall be consistent throughout the system and shall be inherent within the rubber, not painted.

Mechanical Joints

Mechanical joints for fittings shall conform to ANSI/AWWA Standard C111/A21.11-12. Bolt holes for mechanical joints shall be equally spaced, and shall straddle the vertical centerline. Tee head bolts and hexagonal nuts for all mechanical joints in fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11-12. Glands shall be of ductile-iron construction for ductile iron fittings, and cast gray iron or ductile iron for cast gray-iron fittings.

The proper number of gaskets, glands, bolts and nuts, all conforming to ANSI/AWWA Standard C111/A21.11-12, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protective containers. Follower glands held in place with set screws will not be acceptable. Segmented glands will not be acceptable.

Mechanical Joint Megalug-Type Restraining Systems

In any mechanical joint or push on joint underground piping system restrained glands may be utilized for underground pipeline. The ASTM A536 ductile iron casting of the restrained gland shall be bonded powder coated. The wedge and wedge assembly shall have a bonded liquid polymer coating applied for corrosion protection. The gland shall utilize torque limiting twist off wedge actuation screws.

Foreign and domestic manufactured restrained glands are allowed for pipelines 24-inches and below unless otherwise required by the Department due to Federal or State funded projects which require domestic manufacture. In sizes 30, 36, 42 and 48-inch the prior written permission of the Engineer is required to use non-domestic manufactured restraining glands. The country of origin shall be clearly identified on the restraining gland and shop drawing.

The Department absolutely reserves the right to require other forms of restraint where in the opinion of the Engineer the use of this form of restraint is not in the best interest of the Department and his decision shall be final. Use of this type of restraint is restricted to underground mechanical joint or push-on joint applications and in general may not be used above grade or as a substitute for flanged joints.

The Megalug restraint systems manufactured by EBAA Iron Sales, Eastland Texas, will be considered the standard of quality for comparison purposes and if the Department has any doubts as to the durability, quality or ability to restrain of a proffered substitute, the entity offering the substitute shall bear the entire burden of proving this equality to the complete satisfaction of the Engineer. Other manufacturers producing this type of restraint system shall submit data with their shop drawings showing that their restraint system has been in the marketplace for a minimum of three years in this country.

Each thrust-resistant mechanical joint or push on joint made up with this type of restraint and the pipe and fitting of which it is a part, shall be designed to withstand an axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions without reduction because of its position in the pipeline nor for support from external thrust blocks.

This type of joint restraint shall not be used above grade except as previously specified nor shall it be used as a carrier pipe within a casing. This type of restraint shall not be used with tape wrapped pipe or with too great a coating thickness on the exterior of the pipe.

Restrained Push-on Joints (Single Gasket Non-Gasket Restrained)

Restrained joints in pipe and fittings shall be of the single gasket push-on type, and shall conform to all applicable provisions of ANSI/AWWA Standard C111/A21.11 and the following requirements:

Thickness of the pipe barrel remaining at grooves cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained pipe as specified in Section 3.1 above.

Restrained joints using field welding, set screws, or gaskets with expanding metal inserts are not acceptable.

The restraining components, when not cast integrally with the pipe and fittings, shall be ductile iron or a high strength non-corrosive alloy steel.

Tee head bolts and hexagonal nuts for all restrained joints in pipe and fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11, except that the length of the bolts shall meet the requirements for the restrained joint design.

The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protection containers.

Each thrust-resistant joint and the pipe and fitting of which it is a part, shall be designed to withstand the axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions without reduction because of its position in the pipeline nor for support from external thrust blocks.

Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly. During deflection, all components in the restrained system shall be in contact to provide an equal force on all contact areas.

When restrained spigot ends are ordered for items of Group A, the corresponding bell ends of the pipe to be restrained (also within Group A), shall be furnished with the required matching restraining features at no additional cost other than the price bid per foot of pipe.

Flanged Joints

Connecting pieces with one end flanged and the other end either plain-end or mechanical joint, shall conform to ANSI/AWWA Standard C110/A21.10. Joint material for both the flanged end and the mechanical joint accessories for connecting pieces with a mechanical joint end shall be furnished as specified.

Other types of flanged fittings, and flanged pipe, shall conform to the following requirements unless otherwise stated in the order:

Flanged fittings shall conform to ANSI/AWWA Standard C110/A21.10, as specified hereinabove.

Flanged ductile-iron pipe with integrally cast flanges shall be manufactured in accordance with

ANSI/AWWA Standard C151/A21.51, and with provisions contained hereinabove for centrifugally cast ductile iron pipe, and shall be furnished with ANSI Standard Class 125 flanges, plain faced and drilled, conforming to ANSI Standard B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", latest revision. Hollow back flanges are not acceptable.

Flanged ductile-iron pipe with threaded flanges shall be manufactured in accordance with ANSI/AWWA Standard C115/A21.15, "Flanged Ductile-Iron Pipe With Ductile-Iron or Grey-Iron Threaded Flanges", and shall be rated for a working pressure of 250 psi, minimum. The nominal thickness of flanged ductile-iron pipe, 6-inch and larger, shall not be less than those shown in Table 1 of ANSI/AWWA Standard C115/A21.15. The nominal thickness of 4-inch flanged ductile-iron pipe shall be Class 54 (min.) conforming to Tables 3 and 4 of ANSI/Standard C151/A21.51. Flanges shall be solid-back.

The pipe shall be furnished with ANSI Standard Class 125 flanges, plain faced and drilled, conforming to ANSI Standard B16.1, latest revision. Hollow back flanges and grey-iron flanges shall not be acceptable for use as threaded flanges. Threaded flanges shall be individually fitted and machine tightened on the threaded pipe by the manufacturer, and shall not be interchangeable in the field.

Flanges shall be back-faced parallel to the face of flange. Prior to assembly of the flange onto the pipe, apply a thread compound to the threads to provide a leak-free connection. There shall be zero leakage through the threads at a hydrostatic test pressure of 250 psi without the use of the gasket. Pipe lengths shall be as ordered. Removal of flanges, cutting and re-threading the pipe, and re-installing the flanges will not be permitted in any case. Where a raised face flange connects to a flat-faced flange, remove the raised face of the flange.

All flanges on ductile-iron pipe and fittings shall be of ductile iron, class 70-50-5 in accordance with ANSI/AWWA C110/A21.10. All joint materials for flanged pipe and fittings, shall be supplied with all pipe or fittings ordered. Bolts and nuts shall comply with all requirements of Appendix Section A.1 of ANSI/AWWA Standard C115/A21.15-11 except that both shall be stainless steel. Bolts shall be of sufficient length to fully engage all threads in the nut. Unless ring gaskets are specified, gaskets shall be full-faced, and gaskets shall be of 1/8-inch thickness. Gaskets shall fully conform to the requirements of ANSI/AWWA Standard C115/A21.15-11 Appendix Section A.2 except that gaskets shall be SBR for water and neoprene for sewer usages.

Grooved-end Fittings and Couplings

Grooved-end fittings shall conform to ANSI/AWWA C110/A21.10-12 with grooved ends conforming to ANSI/AWWA C606-11, radius cut rigid joints. Fitting material shall conform to ASTM A48, Class 30; ASTM A126, Class B; or ASTM A536, Grade 65-42-10. Wall thickness of ductile-iron (ASTM A536) fittings shall conform to AWWA C110 or C153; wall thickness of cast-iron fittings shall conform to AWWA C110. Fittings and couplings shall be furnished by the same manufacturer.

Grooved-end pipe couplings shall be ductile iron, ASTM A536 (Grade 65-45-12). Gaskets shall be Buna-N and shall conform to ASTM D2000. Bolts in exposed service shall conform to ASTM A183, 110,000-psi tensile strength. Bolts in buried or submerged service shall be ASTM A193, Grade B8, and Class 2.

Couplings for pipe 24 inches and smaller shall conform to AWWA C606 for flexible radius ductile-iron pipe, except where rigid radius couplings are required to connect to fittings.

Couplings for pipe sizes 30 and 36 inches shall be in accordance with the coupling manufacturer's published literature for tolerances and dimensions for flexible and rigid radius cut joints. Couplings shall be Victaulic Style 31, Gustin-Bacon No. 500, or equal.

Couplings for pipe larger than 36 inches shall conform to AWWA C606 for shouldered end pipe. Couplings shall be Victaulic Style 44 or equal.

Grooved-end adapter flanges for piping 24 inches and smaller having an operating pressure of 150 psi and less shall be Victaulic Style 341 or 342 or equal. Flange dimensions shall conform to ASME B16.1, Class 125.

Grooved-end transition couplings for connecting ductile-iron pipe 12 inches and smaller to steel pipe shall be Victaulic Style 307 or equal.

Outlets and Nozzles

Provide outlets three quarters of an inch and smaller by direct tapping Ductile Iron Pipe in accordance with AWWA C600-10, Section 4.8. Provide outlets larger than three quarters of an inch up to 2 inches by tapping the pipe and attaching a service clamp. or use a threaded welded-on boss. Use stainless steel clamps for exposed piping. For outlets larger than 2 inches, use a tee with a flanged outlet. For outlets larger than 2 inches in buried piping, use a tee with a restrained joint outlet.

Ductile-Iron Pipe Weldments

All welding to ductile-iron pipe, such as for bosses, joint restraint, and joint bond cables, shall be done at the place of manufacture of the pipe. Perform welding by skilled welders experienced in the method and materials to be used. Welders shall be qualified under the standard qualification procedures of the ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.

Welds shall be of uniform composition, neat, smooth, full strength, and ductile. Completely grind out porosity and cracks, trapped welding flux, and other defects in the welds in such a manner that will permit proper and complete repair by welding.

Material for fittings with welded-on bosses shall have a Charpy notch impact value of minimum 10 ft-lbs under the conditions defined in ANSI/AWWA C151/A21.51-09. Test completed welds by the liquid penetrant method per ASTM E165.

Completed welds shall be inspected at the place of manufacture by the liquid penetrant method. Conform to the requirements specified in ASTM E165, Method A, Type I or Type II. The materials used shall be water washable and nonflammable.

E. LININGS AND COATINGS

Saltwater Intrusion and Corrosive Soils Requirements

In saltwater intrusion areas where the installation is subject to groundwater level variation (East of I-95 or saltwater intrusion line), the Department shall require the use of V-Bio Enhanced Polyethylene Encasement and ductile iron pipe with a zinc basecoat under the

asphaltic topcoat. All ductile iron pipe and fittings shall be wrapped with the V-Bio Polyethylene Enhanced Encasement and have the zinc protective coating factory applied.

For corrosive soils encountered outside of saltwater intrusion areas during construction V-Bio Polyethylene Encasement shall be installed to protect the ductile iron main, fittings and valves.

Zinc Basecoat: The exterior of ductile iron pipe shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of the zinc applied shall be 200 g/m² of pipe surface area. A finishing layer topcoat shall be applied to the zinc. The mean dry film thickness of the finishing layer shall not be less than 3 mils with a local minimum not less than 2 mils. The coating system shall conform in every respect to ISO 8179-1 "Ductile iron pipes - External zinc-based coating - Part 1: Metallic zinc with finishing layer. Ductile iron fittings shall also have a zinc protective coating sprayed on at the factory at a minimum of 3 mils.

The V-Bio Polyethylene Enhanced Encasement shall be accordance with AWWA C600 and ANSI/AWWA C105/A21.5, "Polyethylene Encasement of Ductile-Iron Pipe Systems". Color shall be blue for potable water, purple for recycled water, and green for sanitary sewage service. Polyethylene encasement for use with ductile iron pipe systems shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than 8 mils. The inside layer of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a corrosion inhibitor and antimicrobial biocide to control galvanic corrosion. Product: V-Bio or approved equal.

Polyethylene encasement for ductile-iron pipe shall be supplied as a flat tube meeting the dimensions of Table 1 in AWWA C105 and shall be supplied by the ductile-iron pipe manufacturer.

Plastic adhesive tape shall consist of polyolefin backing and adhesive which bonds to common pipeline coatings including polyethylene. Products: Canusa Wrapid Tape; Tapecoat H35; Polyken 934; AA Thread Seal Tape, Inc.; or approved equal.

Install the polyethylene to completely encase the pipe and fittings to provide a watertight corrosion barrier. Continuously secure overlaps and ends of sheet and tube with polyethylene tape. Make circumferential seams with two or more complete wraps, with no exposed edges. Tape longitudinal seams and longitudinal overlaps, extending tape beyond and beneath circumferential seams. Wrap bell-spigot interfaces, restrained joint components, and other irregular surfaces with wax tape or moldable sealant prior to placing polyethylene encasement. Minimize voids beneath polyethylene.

Place circumferential or spiral wraps of polyethylene tape at 2-foot intervals along the barrel of the pipe to minimize the space between the pipe and the polyethylene. Overlap adjoining polyethylene tube coatings a minimum of 1 foot and wrap prior to placing concrete anchors, collars, supports, or thrust blocks. Hand-wrap the polyethylene sheet, apply two complete wraps with no exposed edges to provide a watertight corrosion barrier, and secure in place with 2-inch-wide plastic adhesive tape. Repair polyethylene material that is damaged during installation. Use polyethylene sheet, place over damaged or torn area, and secure in place with 2-inch-wide plastic adhesive tape.

Repair polyethylene encasement at all service connections in accordance with AWWA C600-10, Section 4.8.

Asphaltic Coating

All Ductile Iron pipe and fittings shall be outside-coated with an asphaltic material applied by means of the airless spray method. The exterior coating shall comply with ANSI/AWWA C151/A21.51 for this type of coating, shall be smooth without pinholes, thin, bare or overly thick areas. Smoothness shall be such that when hand rubbed, no "sand paper" feeling will be experienced and such that the spigot area will readily slide through the gasket without pulling, tearing, rolling or otherwise disturbing the sealing capabilities of the gasket. Spigot ends shall be beveled prior to coating to an extent that will permit ready insertion of the spigot through the gasket area.

Cement-Mortar Lining

Ductile Iron Pipe and fittings unless otherwise specified shall be double-thickness cement-lined and seal-coated in accordance with ANSI/AWWA Standard C104/A21.4-14, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings".

Ceramic Epoxy Lining

Ductile Iron Pipe and fittings where so specified shall be lined with ceramic epoxy

Ceramic epoxy shall contain pigmentation to resist ultraviolet exposure under the same conditions.

All ductile iron pipe and fittings for which ceramic epoxy lining is to be applied shall be delivered to the application facility without asphalt, cement lining or other lining on the interior surface or the first 6 inches on the spigot end of the pipe exterior.

Ceramic epoxy material shall be a high-build multi-component Amine cured Novalac epoxy, Protecto 401, by Vulcan Painters, Inc. of Bessemer, AL 35021 or Department-approved equal. Permax CTF is also an acceptable sanitary sewer lining.

Ceramic epoxy material shall meet the following criteria and shall be accompanied by certification of the following test results:

- A. A permeability rating of 0.00 when tested according to Method A of ASTM E96-00 "Test Method for Water Vapor Transmission of Materials", Procedure A with a test duration of 30 days.
- B. The following test must be run on coupons from factory lined ductile iron pipe:
 - 1. ASTM B117 Salt Spray (scribed panel) - Results to equal no more than 0.5mm undercutting after one year.
 - 2. ASTM G95 Cathodic Disbondment 1.5 volts @ 77 degrees F. Results to equal no more than 0.5mm undercutting after 30 days.
 - 3. Immersion Testing rating using ASTM D714-87 (1994).
 - a. 20% Sulfuric Acid - No effect after one year.
 - b. 25% Sodium Hydroxide - No effect after one year.
 - c. 160° F. Distilled Water - No effect after one year.
 - d. 120° F. Tap Water (scribed panel) - 0.0 undercutting after one year with no effect.

- C. A statement from the manufacturer attesting to the fact that at least 20% of the volume of the lining contains ceramic quartz pigment.
- D. A statement concerning recoat ability and repair to the lining.

Ceramic Epoxy Application

- a. The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.
- b. **Surface Preparation**
Prior to abrasive blasting, the entire area which will receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease or any substance is present which can be removed by solvent shall be solvent cleaned using the guidelines outlined in SSPC-1 Solvent Cleaning. After the surface has been made free of grease, oil or other substances, all areas to receive the protective compounds shall be abrasive blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before coating must be re-blasted to remove all rust.
- c. **Lining Application**
After the surface preparation and within 8 hours of surface preparation, apply to the interior of pipe and fittings a minimum forty (40) mils dry film thickness of the protective lining. No lining shall take place when the substrate or ambient temperature is below 40 degrees Fahrenheit. The surface also shall be dry and dust free. If flange ends are included in the Project, the linings shall not be used on the face of the flange; however, full face gaskets must be used to protect the ends of the pipe. The 40-mil system shall not be applied in the gasket grooves.
- d. **Coating of Gasket and Spigot Ends**
Coat the gasket area and exterior of the spigot end for 6 inches back from the end of the spigot with six (6) mils minimum, ten (10) mils maximum of Protecto Joint Compound. This coating shall be applied by brush to ensure complete coverage. Care shall be taken that the coating is smooth without excess buildup in the gasket groove or on the spigot end. All material for the gasket groove and spigot end shall be applied after the application of the lining as specified in the preceding paragraph.
- e. **Number of Coats**
The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The time between coats shall never exceed that time recommended by the lining material manufacturer. No material shall be used for lining which is not indefinitely recoated able with itself without roughening the surface.
- f. **Touch-Up and Repair**
Protecto Joint Compound shall be used for touch-up or repair. Procedures shall be in accordance with manufacturer's recommendations.

F. INSPECTION AND CERTIFICATION

a. Inspection

1. All ceramic epoxy lined ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PC-2 Film Thickness Rating. Re-line any pipe whose lining is below the specified minimum thickness.
2. The interior lining of all pipe and fittings shall be tested for pinholes with a nondestructive 2,500 volt test. Re-line any pipe not passing the test.
3. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on the date.

Procedures for Sealing Cut Ends and Repairing Field Damaged Areas

1. Remove burrs caused by field cutting of ends or handling damage and smooth out the edge of the lining if rough.
2. Remove all traces of oil, grease, asphalt, dust, dirt, etc.
3. Areas of loose or damaged lining associated with field cutting the pipe shall be repaired, if approved by the Engineer, as recommended by the pipe manufacturer. The damaged area shall be stripped back by chiseling or scraping about 1 to 2 inches into the well-adhered lining before patching.

The exposed metal and the 1 to 2-inch lining overlap shall be roughened with a coarse grade of emery cloth (#40 grit), rasp or small chisel. Avoid wire brushing or similar buffing which would make the surface too smooth for good adhesion.

4. With the area to be sealed or repaired absolutely, clean and suitably roughened, apply a coat of Protecto Joint Compound by brush in accordance with the manufacturer's recommendations.

2.02 PIPE AND FITTINGS: POLY VINYL CHLORIDE (PVC)

- A. Poly (vinyl chloride (PVC) pipe and fittings specified herein are small diameter PVC with threaded, flanged and solvent cemented joints.
- B. All poly (vinyl chloride) (PVC) pipe and fittings shall be made from high impact, rigid poly (vinyl chloride) compounds. Pipe and fittings shall be marked indicating size, type and schedule, ASTM Designation, manufacturer or trade mark, and shall bear the NSF (National Sanitation Foundation) seal of approval. Wherever the abbreviation PVC is used in these Specifications in relation to pipe and fittings, it shall mean poly (vinyl chloride) plastic pipe and fittings as specified herein.
- C. PVC pipe shall be Schedule 80 unless Schedule 120 pipe is called for on the Plans or by the Engineer, Type I, Grade I, or Class 12454B with socket ends, and shall comply with ASTM Standard D1785, "Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120". Products intended for contact with potable water shall be evaluated, tested, and certified for conformance with ANSI/NSF Standard No. 61 or the health effects portion of NSF Standard No. 14 by an acceptable certifying organization when required by the regulatory authority having jurisdiction.

- D. Schedule 80 Socket-type fittings shall comply with ASTM Standard D2467, "Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80" and D2464 "Specification for Threaded Poly Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80, for threaded fittings.
- E. Joining cement for PVC pipe and fittings shall comply with ASTM Standard D2564, "Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings". Cemented joints shall be made in accordance with ASTM Standard D-2855, "Recommended Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings".
- F. Flanges: One piece molded hub type flat face flanges, 125 pound standard as specified under fittings hereinbefore.
- G. Gaskets: Full faced, 1/8-inch thick, Neoprene/EPDM (for sewer) or SBR (for water).
- H. AISI Type 316 stainless steel, ASTM A193, Grade B8M hex bolts and ASTM A 194 Grade E8 hex head nuts. Bolts shall be fabricated in accordance with ANSI B 1812 and provided with washers of the same materials as the bolts.

2.04 PIPE AND FITTINGS: COPPER

- A. Pipe: Copper pipe shall be Type K for interior piping and Type K Soft Temper for exterior piping, both conforming to ASTM B88, seamless, round, drawn tubing.
- B. Fittings: Solder joint fittings shall be wrought copper and bronze fittings conforming to ANSI B16.22 or cast brass fittings conforming to ANSI Standard B16.18. Fittings for use with copper tubing shall be one of the following:
 - 1. Cast Bronze Solder-Joint Fittings: Solder joint fittings of this type shall be cast bronze fittings conforming to ANSI B16.18, "Cast Brass Solder-Joint Fittings", and ASTM Standard B62, "Composition Bronze or Ounce Metal Castings", as manufactured by Chase Brass and Copper Co., Stanley G. Flagg & Co., Inc., or Department-approved equal.
 - 2. Wrought Copper Solder-Joint Fittings: Solder joint fittings of this type shall be wrought copper fittings in accordance with ASNI B16.22, "Wrought Copper and Bronze Solder-Joint Pressure Fittings".
- C. Solder: Solder shall consist of 95 percent tin and 5 percent antimony. Soldering shall be in conformance with Section 3 of the Copper and Brass Research Association Copper Tube Handbook.
- D. Connection of copper pipe or fittings with galvanized pipe or fittings shall be made with dielectric fittings. Connect copper pipe to direct-taps to Ductile Iron Pipe with an insulating union. Wrap the copper pipe with polyethylene tape at least two feet in length beyond the point of connection.

2.05 HIGH DENSITY POLYETHYLENE (HDPE) PIPE FOR USE IN POTABLE WATER SERVICES

- A. Smooth wall high density polyethylene pipe for use in potable water services 3.5-inch nominal outside diameter and less shall meet ASTM D3350, and shall be PE 335434C. Pipe shall meet the standards of ASTM F714, as modified herein, including the "Government/Military Procure-

ment" sections. Minimum hydrostatic design basis shall be 1600 psi. In all cases, hydrostatic design basis and pressure rating shall be as determined using the methods of ASTM F714. Pipe of this type shall be butt-fusion welded at joints. All welding of joints shall be in strict conformity with the recommendations of the pipe manufacturer and by a firm or individual recommended to the Engineer of Record in writing by the manufacturer.

- B. As a part of the shop drawing submittals, submit the following signed by a Florida Registered Engineer, all calculations to determine, the pipe thickness, SDR rating, allowable stresses, in accordance with ASME B31.8 -1992, Table A842.22 as required by the pipe manufacturer.
- C. All mechanical fittings utilized with HDPE pipe and tubing services, shall conform with ANSI/AWWA C800-01 "Underground Service Line Valves and Fittings" as modified herein, shall utilize AWWA Standard (Mueller) threads on tapped pipe and tapping saddles; shall be; designed and manufactured to withstand a sustained working pressure of 150 psi and to restrain the pipe against pull out under loading beyond that causing tensile yield in the HDPE pipe or tubing connected. The manufacturer shall supply certification of these capabilities and fittings shall not be accepted or installed without said certification. If fittings are being supplied to the Department the certification shall ship with the fittings and payment will not be made without this certification. At the discretion of the Engineer, this certification may be required to be signed and sealed by a professional engineer licensed to practice in the state where the supplying firm is located or in the State of Florida. His decision in this regard shall be final.
- D. In all cases, fittings shall be installed in strict accordance with the manufacturer's instructions.
 - 1. HDPE PIPE FOR WATER SERVICES:

All 2-inch high density polyethylene pipe used for services shall be IPS-O.D. controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi at a Factor of Safety of 2.5 or greater, nominal outside diameter of 2.375-inches, minimum wall thickness of 0.264-inches, PE 3408, all in conformance with ASTM D3035-95 "Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter". Pipe shall comply with ANSI/AWWA C901-96 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein. Pipe shall have a (natural) inner core with a blue colored outer shell.

Pipe shall have footage marks at a maximum interval of every two feet. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-14 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell. Pipe shall comply with NSF 61 or 14.

Submit manufacturer's certification of compliance with all of the above requirements. Certification shall ship with the pipe on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. Certification shall be signed and sealed by a professional engineer licensed to practice in the State of Florida.

2. HDPE TUBING FOR WATER SERVICES:

All 1-inch high density polyethylene tubing used for services shall be CTS-O.D. Controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi, nominal outside diameter of 1.125-inches, minimum wall thickness of 0.125-inches, PE 3608, all in conformance with ASTM D2737-12 "Polyethylene (PE) Plastic Tubing". Tubing shall com-

ply with ANSI/AWWA C901-08 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein. Tubing shall have a (natural) inner core with a blue colored outer shell.

Tubing shall have footage marks at a maximum interval of every two feet. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-14 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell.

Tubing shall comply with NSF 61 or 14. Submit Manufacturer' shall supply certification of compliance with all of the above requirements. Certification shall ship with the tubing on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. When required by the Chief, Engineering Division, Miami-Dade Water and Sewer Department or his designee, certification shall be signed and sealed by a professional engineer licensed to practice in the State of Florida.

2.06 WALL SLEEVES, PIPES AND CASTINGS

- A. Wall Sleeves: Wall sleeves shall be of cast iron, ductile iron or carbon steel with steel galvanized after fabrication as specified in Section 15065, Miscellaneous Materials, under wall pipe. Sleeves shall be provided with seals and shall be oversized as required for the installation of seals. Sleeves shall terminate flush with finished surfaces of walls and ceilings, and shall extend 2-inches above the finished floor. Escutcheons shall be provided at walls and floor to completely conceal the sleeves smaller than 3-inches. Escutcheons shall be brass or cast iron, nickel plated split-type.
- B. Interior: Wall sleeves shall be installed for all piping passing through interior walls and floors, except where noted on the Drawings. Sleeves shall be of sufficient size to pass the pipe without binding.
- C. Wall Sleeve Seals: Wall sleeve seals shall be modular mechanical type consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely water-tight seal between the pipe and wall sleeve. The synthetic rubber shall be suitable for exposure to treated sewage effluent and groundwater. Bolts, nuts and hardware shall be 18-8 stainless steel. The seals shall be Link Seal as manufactured by Thunderline Corporation or Department-approved equal, and the wall sleeve and seal shall be sized as recommended by the seal manufacturer.
- D. All piping passing through exterior walls and base slabs shall be provided with wall pipes. All wall pipes shall be of ductile iron and shall have an intermediate flange or waterstop located in the center of the wall. Each wall pipe shall be of the same grade, thickness and interior coating as the piping to which it is joined. Those portions of the wall pipes that are buried shall have a coal tar outside coating.

2.07 STEEL CASING (JACKING AND BORING)

See Section 15070, "Jacking and Boring"

2.08 STEEL PIPE (AERIAL CROSSING)

See Section 15075, "Aerial Crossings"

PART 3 - EXECUTION

3.01 General:

- A. Furnish and maintain all barricades and flashing warning lights necessary to warn of the construction throughout the Project.
- B. Pipe and fittings shall at all times be handled with great care to avoid damage. Exercise particular care not to injure pipe coatings. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions.
- C. All work shall be performed by skilled workmen experienced in pipeline construction.
- D. All pipe and fittings shall be adequately supported by clamps, brackets, straps, concrete supports, rollers or other devices as shown and/or specified. Supports or hangers shall be spaced so that maximum deflection between supports or hangers shall not exceed 0.050 inch for pipe filled with liquid, but shall not be further than 6 feet apart, whichever is closer, unless otherwise shown. All pipe supports shall be secured to structures by approved inserts or expansion shields and bolts.
- E. All pipe shall be thoroughly cleaned internally before being installed. All pipes, except oxygen service, air and gas, shall be flushed with water and swabbed to assure removal of all foreign matter before installation. Air and gas piping shall be tapped with a hammer to loosen scale or other foreign matter that might be within the pipe, and then thoroughly blown with a high pressure air hose. Furnish and maintain suitable air compressor.
- F. Whenever possible, the pipe shall be installed with minimum 48-inches of cover. Deviations shall not be installed without written approval by the Owner.
- G. Joints may only be opened to adjust alignment by half of the AWWA or manufacturer's recommended opening (which is smaller).
- H. Pipe Sleeves and Wall Casings: Pipe sleeves and wall casings shall be provided at the locations called for on the Drawings and specified herein. These units shall be as detailed and of the material as noted on the Drawings and specified herein. They shall be accurately set in the concrete or masonry to the elevations shown. All wall sleeves and castings required in the walls shall be in place when the walls are poured. Ends of all wall casings and wall sleeves shall be of a type consistent with the piping to be connected to them.
- I. Tie Rods: Unless otherwise indicated on the Drawings, the size and number of tie rods for a joint or installation shall be as recommended by the manufacturer's design chart for a working pressure of 150 psi. Tie rods shall be installed as recommended by the manufacturer.

3.02 EXCAVATION FOR PIPING

- A. Make all excavation necessary for the construction of the pipelines, connections, valves and appurtenances, to the lines and grades shown on the Plans.

- B. Excavate the trench at least 6 inches below pipe laying grade as shown on the Plans. Install sheeting and shoring for the protection of workers in trenches, and where it is necessary for pipe installation and property protection or required by the Trench Safety Act. The cost of dewatering any excavation shall be at the Contractor's expense. The disposal of water removed from an excavation shall be in a manner which will not create a hazard, or be detrimental to the public health or to public or private property.
- C. Obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way or into any existing drainage structure or facility. Furnish and maintain all construction signs required.

3.03 INSTALLATION OF PIPE, FITTINGS AND VALVES

A. General:

- 1. The design Drawings are in some cases diagrammatic. They may not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. . Install gravity lines at uniform grade to low point after field verification of low point invert.
- 2. The centerline of the pipe shall not vary by more than 2 inches from the location shown on the Plans and the top of the pipe shall not vary by more than 2 inches from the established grade, except at points where this tolerance must be changed to clear obstructions, or make connections.
- 3. Limit onsite pipe storage to a maximum of one week. Use unloading and installation procedures that avoid cracking of the lining. If necessary, use plastic sheet bulkheads to close pipe ends and keep cement-mortar lining moist. Deliver the pipe alongside the pipe laying access road over which the pipe trailer-tractors can travel under their own power. Place the pipe in the order in which it is to be installed and secure it from rolling. Sandbags may be used to support the pipe in the ditch but no pipe shall be laid on blocks, except by the written permission of the Engineer of Record. Do not move pipe by inserting any devices or pieces of equipment into the pipe barrel. Field repair linings damaged by unloading or installation procedures. Flanged joints, mechanical joints and push-on joints in cast iron pipe and fittings may be made under water.

B. Installation of Ductile Iron Pipe

- 1. Install Ductile Iron Pipe in accordance with ANSI/AWWA C600-10 "Installation of Ductile-iron Mains and Their Appurtenances", and the following. For potable water pipelines, comply with NSF/ANSI 61 "Drinking Water System Components – Health Effects. All bends, tees, and plugs, unless otherwise specified, shall be backed with concrete to undisturbed ground. Provision shall be made to prevent concrete from adhering to plugs or bolts by wrapping in polyethylene sheet complying with ANSI/AWWA C105/A21.5-05.
- 2. Bolts, nuts and rubber gaskets for use in flanged and mechanical joints shall be stored under cover. During laying operations, do not place tools, clothing, or other materials in the pipe. Gaskets shall not be exposed to heat, light or any petroleum products, shall be kept clean and shall not be handled with greasy or dirty hands. When pipe laying is not in progress, close the ends of the installed pipe by a child- and vermin-proof plug.

3. Assemble Flanged joints in accordance with the written recommendations of the pipe manufacturer. Before making up flanged joints in cast iron pipe and fittings, the back of each flange under the bolt heads, and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Cut the bore of the gaskets such that the gaskets do not protrude into the pipe when the flange bolts are tightened.
4. Before laying the ductile iron pipe, all lumps, blisters and excess asphaltic coating shall be removed from the bell and spigot ends of each pipe and the outside of the spigot and the inside of the bell wire brushed and wiped clean and dry. The entire gasket groove area shall be free of bumps or any foreign matter which might displace the gasket. The cleaned spigot and gasket shall not be allowed to touch the trench walls or trench bottom at any time. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. Exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall be made only after the joint has been assembled.
5. Cutting of ductile iron pipe for inserting valves, fittings, etc., shall be done with a mechanical pipe saw in a neat and workmanlike manner without damage to the pipe, the lining, or the coating.
6. Unless otherwise directed, ductile iron pipe shall be laid with the bell ends facing in the direction of laying; and for lines on an appreciable slope, the bells shall, at the discretion of the Engineer, face upgrade. Small angular changes (less than 2.5 degrees) in horizontal alignment defined in the drawings by a point of inflection (PI) with no accompanying curve data shall be approximated as a curve by deflecting an equal amount of equal length pipe segments to create a curve equally distributed on both sides of the given PI. Accomplish a larger (greater than or equal to 2.5 degrees) change in horizontal alignment where a curve is not called for in the drawings through the use of an elbow placed at the station of the PI shown in the drawings. Small angular changes (less than 2.5 degrees) in vertical alignment may be accomplished by the use of pulled joints. For larger vertical deflections, place an elbow at the station and elevation of the vertical PI shown in the drawings.
7. Push-on and mechanical joints in ductile iron pipe and fittings shall be made in accordance with the manufacturer's written recommendations except as otherwise specified herein. Joints between push-on and mechanical joint pipe and/or fittings shall be made in accordance with AWWA Standard Specifications, "Installation of Ductile Iron Water Mains and Appurtenances," C600-10, except that deflection at joints shall not exceed one-half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in AWWA C600-10, whichever is the lesser amount.
8. Flanged joints shall be used only where indicated on the Plans. Before making up flanged joints in the pipeline, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.
9. Bolts and nuts in flanged and mechanical joints shall be tightened in accordance with the written recommendations of the pipe manufacturer for a leak-free joint. Exercise caution to

prevent overstress. Torque wrenches shall be used until, in the opinion of the Engineer, the workmen have become accustomed to the proper amount of pressure to apply on standard wrenches.

C. Installation of PVC Pipe:

1. In the installation of glue joint PVC pipe, the pipe shall first be cut square and smooth. Wipe all surfaces to be connected with a cloth moistened with an appropriate solvent and remove any foreign matter from socket of fitting. Using an ordinary paint brush of width about equal to the nominal pipe size, apply a generous coat of cement to inside and shoulder of socket, flowing on but not brushing out. A similar coat shall then be applied to the end of the pipe for at least the same distance on the pipe as the depth of socket, and to the cut end. Pipe and fittings shall then be pressed firmly together and the pipe turned a quarter to a half turn to evenly distribute the cement. The cementing and joining operation must not exceed one minute. Allow 24 hours set-up time before applying pressure. Sand shall be used as backfill material around pipe installed underground.
2. Thread Sealant: Teflon tape.
3. All rigid PVC pipe shall be cut, made up, and installed in accordance with the pipe manufacturer's recommendations. Plastic pipe shall be laid by snaking the pipe from one side of the trench to the other. Offset shall be as recommended by the manufacturer for the maximum temperature variation between time of solvent welding and during operation.
4. Schedule 80 pipe shall not be threaded. Use Schedule 80 threaded nipple where necessary to connect to threaded valve or fitting.
5. Only strap wrenches shall be used for tightening threaded plastic joints, and care shall be taken not to over tighten these fittings.
6. Provide adequate ventilation when working with pipe joint solvent cement.
7. Testing: All lines shall be hydrostatically tested at the pressures specified elsewhere herein or at the design pressures.
8. Supports And Hangers: In accordance with the manufacturer's recommendations.

D. Installation of Copper Pipe:

1. Tubing above ground shall, whenever possible, be run in full lengths between fittings, valves and connections and joints shall be kept to a minimum. All connections shall be made without sharp bends or kinks in the tubing. Above ground tubing shall be supported at short intervals to prevent sagging and vibration.
2. All copper pipe shall be reamed to full diameter before joining. The ends of pipe and the inside of fittings shall be cleaned and flux applied to the entire area of pipe to be soldered.

E. Joint Pipe:

1. Threaded Pipe: Ream all pipe after cutting and before threading. Use non-hardening pipe compound "Tite-Seal" or approved equal, on male threads only.
2. Provide nipples of same material and weight as pipe used. Provide extra strong nipples

when length of unthreaded part of nipple is less than 1-1/2".

3. Provide reducing fittings rather than bushings where changes in pipe sizes occur.
 4. Provide dielectric unions or flanges between copper and steel piping and between brassware and steel. Do not use steel and copper piping in the same system without such isolation.
- F. Unions: Provide unions or flanges in all domestic water service lines at each piece of equipment, specialty valves or at other locations required for ready disconnect.
- G. Pipe Protection:
1. Paint all un-insulated metal (ductile iron or steel) piping underground with two coats of asphaltic paint.
 2. Wrap soil pipe that touches metal or is exposed to masonry with a layer of 6 mil polyethylene.
 3. Spirally wrap all pipe lines embedded in concrete with two layers of 30 lb. felt prior to placing the concrete.
 4. Coat all exposed threads on galvanized steel pipe after assembly with two coats of zinc chromate.
- H. Cleaning and Testing: All of the piping installed under this project shall be tested as follows and as directed by the Engineer.
1. With exceptions as noted below, all ductile iron piping installed under this Contract shall be cleaned and tested according to Paragraph I hereinbelow in this Section:
 - a) Only potable water piping shall be disinfected.
 - b) No leakage shall be permitted for flanged piping.
 - c) No leakage shall be permitted for any type of above ground piping.
 2. Unless otherwise specified elsewhere herein, all PVC pressure system bushings and galvanized steel piping shall be tested at 100 psig. No leakage will be permitted.
- I. Installation of Aboveground and Exposed Piping
1. Aboveground and exposed pipe fittings, valves and accessories shall be installed as shown or indicated on the Drawings.
 2. Piping shall be cut accurately to measurements established at the job site and shall be worked into place without springing or forcing, properly clearing all equipment access areas and openings. Changes in sizes shall be made with appropriate reducing fittings rather than bushings. Pipe connections shall be made in accordance with the details shown and manufacturer's recommendations. Open ends of pipe lines shall be properly capped or plugged during installation to keep dirt and other foreign material out of the system. Pipe supports and hangers shall be provided where indicated and as required to insure adequate support of the piping.

3. Welded connections shall be made in conformity with the requirements of AWWA Standard C 206 and shall be done only by qualified welders. The Engineer may, at his option, require certificates that welders employed on the work are qualified in conformity with the requirements of this standard and/or sample welds to verify the qualifications of the welders. Before testing, field welded joints shall be coated with the same material as used for coating its pipe in accordance with the requirements of AWWA.
4. Flanged joints shall be made up by installing the gasket between the flanges. The threads of the bolts and the faces of the gaskets shall be coated with a suitable lubricant immediately before installation.
5. Joints using Dresser couplings shall be made up as recommended by the manufacturer.
6. Use of perforated band iron (plumber's strap), wire or chain as pipe hangers will not be acceptable. Supports for pipe less than 1-1/2 inches nominal size shall not be more than 8-feet on centers and pipe 2-inches nominal size and larger shall be supported at not more than 10-feet on centers, unless otherwise indicated. Supports for PVC pipe shall be spaced one-half the distance specified above unless otherwise indicated. Any noticeable sagging shall be corrected by the addition of extra supports at the Contractor's expense.

J. INSTALLATION OF HDPE SERVICES

Furnish and install a 10 gauge stranded copper blue tracer wire above all HDPE services.

3.04 FIELD QUALITY CONTROL

- A. All water mains shall be flushed to remove all sand, debris, rock and other foreign matter. Dispose of the flushing water without causing a nuisance or property damage.
- B. Pressure and Leakage Testing: Hydrostatically test all pressure pipe. The test pressure for potable water mains shall be 150 psi. The test pressure for sewage force mains shall be 100 psi. Test Ductile Iron Pipe mains in accordance with ANSI/AWWA C600 latest edition once all backfill is in place and fully compacted, and after all thrust blocks have cured to their design strength. Do not test against closed valves. All pumps, piping and gauges shall be furnished, installed and operated by the Contractor and all such equipment and devices and their installation shall be approved by the Engineer. Pump shall be of a non-pulsating type suitable for this application and gauge accuracy certification may be required at the Engineer of Record's discretion. All pressure and leakage testing shall be done in the presence of a representative of the Department as a condition precedent to the approval and acceptance of the system.
- C Disinfection:

Disinfect in accordance with ANSI/AWWA C651-14 – Disinfecting Water Mains. During the period that the chlorine solution or slug is in the section of pipeline, open and close valves to obtain a chlorine residual at hydrants and other pipeline appurtenances. Swab exposed faces of valves and blind flanges prior to bolting flanges in place with a 1% sodium hypochlorite solution. Disinfect isolation valves, pipe, and appurtenances per AWWA C651, Section 4.7.

Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a 1% sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor. After confirming the chlorine residual, flush the

excess chlorine solution from the pipeline until the chlorine concentration in the water leaving the pipe is either within 0.5 mg/L of the replacement water or no higher than that generally prevailing in the distribution system.

Discharge of chlorinated water into watercourses or surface waters is regulated by the National Pollutant Discharge Elimination System (NPDES). Disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. Schedule the rate of flow and locations of discharges in advance to permit review and coordination with Owner and cognizant regulatory authorities. For measuring chlorine concentration, supply and use a medium range, drop count, DPD drop dilution method kit per AWWA C651, Appendix A.1. Maintain kits in good working order available for immediate test of residuals at point of sampling.

D. Tests for Drain and Gravity Sewer Lines:

1. Drain and gravity sewer lines shall be tested for infiltration and exfiltration.
2. The allowable limits of infiltration or exfiltration or leakage for the drain or sewer lines, or any portion thereof shall not exceed a rate of 100 gallons per inch of internal pipe diameter per mile of pipe per 24 hours with no allowance for laterals or manholes. Duration of test shall be a minimum of two hours.
3. Any part or all of the system may be tested for infiltration or exfiltration, as directed by the Engineer. Prior to testing for infiltration, the system shall be pumped out so that normal infiltration conditions exist at the time of testing. The amounts of infiltration or exfiltration shall be determined by pumping into or out of calibrated drums, or by other approved methods.
4. The exfiltration test will be conducted by filling the portion of the system being tested with water to a level which will provide a minimum head of 2-feet in a lateral connected to the test portion, or, in the event there are no laterals in the test portion, a minimum difference in elevation of 5-feet between the crown of the highest portion of the drain or sewer and the test level.
5. Where infiltration or exfiltration exceeds the allowable limits specified herein, the defective pipe, joints, or other faulty construction shall be located and repaired by the Contractor.
6. Furnish all labor, equipment and materials and shall conduct all testing required, under the direction of the Engineer of Record. No separate payment will be made for this work and the cost for this work shall be included in the prices quoted in the Proposal.
7. Locate and repair all leaks until the leakage is reduced to the limits specified. Any observed leaks or obviously defective joints or pipes shall be repaired or replaced as directed by the Engineer of Record, even though the total leakage is below that specified above.

END OF SECTION

SECTION 15065

MISCELLANEOUS MATERIALS

PART 1 - SCOPE

1.01 GENERAL

Miscellaneous materials necessary for a complete installation, not specified herein, shall be equal in quality to the specified materials suitable for the intended use, and shall conform to the details and notes shown on the Plans. All minor items implied, usually included or required for the construction of a complete operating system, shall be installed whether specified or shown on the Plans, or not.

- 1.02 The Contractor shall furnish and install where shown on the Plans or stated herein, the following materials or equals:

PART 2 - PRODUCTS

2.01	Anchors, chemical adhesive	Stainless Steel HVA type by Hilti Co, or approved equal
2.02	Anchor bolts, eyebolts, nuts washers-steel, including anchor bolts and tie-rods carbon steel	ASTM A325-88a, hot-dip galvanized
2.03	Anchor bolts, nuts, washers, and screws-stainless steel	AISI Type 316 stainless steel
2.04	Anchor straps	1-1/2-inch by 1/8-inch hot dip galvanized each with two 1/2-inch by 3-inch anchor bolts and nuts (galvanized)
2.05	Angle Meter Stops	Conform with AWWA C800, 85-5-5-5 Brass, Inlet Type K Copper Tube, Outlet Meter swivel nut, Lock Wing, NSF 61 Certified, Mueller 14255W, Ford KV23-W, or approved equal.
2.06	Angle Meter Stops	Conform with AWWA C800, 85-5-5-5 Brass, Inlet Inside Iron Pipe Thread, Outlet Meter swivel nut, Lock Wing, NSF 61 Certified, Mueller 14265W, Ford KV13-W, or approved equal.
2.07	Angle valves (for air release valve and flushing valve outlet)	2-inch threaded inlet and outlet valves with hand wheel, bronze body, and composition disc, replaceable disc and seat, screwed-in bonnet Nibco T-311Y, or approved equal.

2.08	Backflow preventer	Pressure reducing 2-inch Series 909, manufactured by Watts Regulator, Co. (or other Department approved model for size and application)
2.09	Backflow preventer (hose)	3/4" bronze hose bibbs Watts No. 8
2.10	Ballast rock	Washed and graded limerock obtained from local sources. Aggregate size shall be 1-1/2 inch to 2-inches in diameter.
2.11	Banding straps for pipe skids	Hot-dip galvanized steel or stainless steel, 1/32-inch thick by 1-1/4 inch wide, minimum, with banding clamps of same material.
2.12	Bedding for copper tubing	Clean white masonry sand
2.13	Bentonite	Baroid Bentonite Mix as supplied by Southwest Florida Service and Supply, or Tony's Drilling Supply (Opa-Locka, FL).
2.14	Blind flanges, cast iron	AISI Standard B16.1, Class 125, plain-faced and drilled. "Hollow Back" flanges not acceptable.
2.15	Bolt, nuts and washers, Aluminum (where required on the Plans)	Aluminum bolts shall conform with AA 2024-T4 Alloy designation, anodized
2.16	Bolts and nuts for flanged pipe joints	Hot-dip galvanized steel, sized pipe joints per ANSI specifications. If in contact with aluminum or stainless steel, AISI Type 316 stainless steel, sized per ANSI specifications.
2.17	Bonding Agent for concrete	High polymer resin dispersed in water "Daraweld-C" by W. R. Grace Co.
2.18	Bore or bell donut adapters for tailpieces	Fernco, Inc.
2.19	Brackets and Pipe Support Clamps	ASTM A36, hot dip galvanized after fabrication
2.20	Branch Assembly (Meter)	Copper inlet with 2-meter swivel nut outlets, NSF 61 Certified, 85-5-5-5 brass, 7 1/2- inch spacing between outlets, Mueller 15362, Ford UV23-42W, James Jones, A.Y. McDonalds 0802M or approved equal.
2.21	Caulking Compound	Hornflex-L (two component compound based on Thiokol polysulfide liquid polymers), W.R. Grace & Co. Apply per manufacturer's recommendation.
		See Metropolitan Dade County Public Works

2.22	Catch Basins	Department Std. Detail SD 2.3, unless shown otherwise on Plans or detailed on specified herein.
2.23	Chain Rail	Chain shall be straight-link machine chain, Type 316L Stainless Steel with approx. 15 links per foot. Each chain section shall be fitted with Type 316L Stainless Steel snap fittings and eye bolt at both ends. Eye bolts shall be affixed to end posts.
2.24	Check valves in meter hook-ups	1-1/2 inch to 2-inch brass with neoprene poppet by Stataflo Products, Inc., or approved equal
2.25	Clean-Outs (toilet area)	Josam 58020, adjustable, with Nikaloy top, or approved equal.
2.26	Concrete louver ventilator blocks	16-inch by 16-inch with bird screen, Denmark's Artstone Co., Miami or approved equal.
2.27	Copper tube straps	Chase No. 1019, 1019R, 1019S. Copper straps for 1-inch tubing, Grinnel Fig. 9124
2.28	Concrete pipe support saddle liner	Neoprene rubber sheet, 1/4-inch-thick w/ 4-ply fabric reinforcement durometer grade 70, cut width 1/2 inch less than saddle with.
2.29	Concrete protecting coating (interior of fuel tank containment top of bottom slab and interior walls from bottom slab up to 3-1/2 feet)	Base: Strongcote WB-114, 1/32-inch by Strongwall Systems Inc. or approved equal. Top: Strongcote SC-112, by 1/32-inch thick Strongway Systems, Inc. or approved equal.
2.30	Copper Tubing	ASTM Standard B-88, Type K annealed and coiled
2.31	Corporation Stops	1-inch Mueller H-15000 (for chlorination, testing and 1-inch service connection). 1-1/2 inch Mueller H-10003, (for air release assembly and 2-inch service connection).
2.32	Coupling Adapters	Flanged, cast iron, Type 912 by Rockwell International, or approved equal.
2.33	Coupling, Flexible (Groove type)	Cast iron Victaulic Style 31 or approved equal, complying with AWWA C606-87. Compatible with pipe material, dimensions, and service, and furnished with neoprene gaskets and stainless-steel bolts and nuts.

2.34	Coupling, Flexible	Vibration and noise insulating expansion joint, design pressure 150 psi, acceptable for drinking water shall be Style 110-A by Unaflex Rubber Corp., distributed by H.S. White Co., Inc., Ft. Lauderdale, or approved equal.
2.35	Coupling, No. Hub	Flexible PVC body conforming with ASTM D5926 and C1173. Stainless steel bands. Fernco or approved equal.
2.36	Coupling, Transition (Ductile Iron)	Center sleeve and end rings of ductile iron conform with ASTM A536 grade 65-45-12; Gaskets NBR (Sewage) SBR (Water). High strength low alloy steel bolting. Coupling conforms with AWWA C219.
2.37	Coupling, Transition (Steel)	Center Sleeve of ASTM A53 grade A steel. End rings of ASTM A795 steel. Gaskets of EPDM. Complies with NSF 61 and AWWA C219. Fusion bonded epoxy interior and exterior coating.
2.38	Disinfectant	As specified in Section UC-175, herein
2.39	Dowel Bars	Continuous threaded, w/ splicer, Type DBT by Richmond Screw Anchor Co.
2.40	Duct caps (Grab Sample Ports)	6" Bronze Andrew industrial Type "DC", Kamlock or equal with 6-inch NPT bronze adaptor Andrews Industrial Type "A", Kamlock, or approved equal.
2.41	Electronic Marker System	Separate frequency for Water, Sewer, and Re-use. <u>Any "approved equal" must be able to communicate with the markers called out below.</u> Search and read mode range of five feet. Each ball to have a separate readable ID number. Ball diameter 4 to 6 inches or less. Filling of ball to be mixture of propylene glycol and water and shall be environmentally harmless if container is ruptured. Shell to be HDPE or other corrosion proof material and completely water tight. 3M 1400 series or approved equal.
2.42	Epoxy for polylining repairs	Two-part coal tar epoxy Madewell 1104 by Madewell Products Corp.

2.43	Epoxy grout, non-shrinking (for setting equipment)	See Specification Section 03600
2.44	Epoxy grout, non-shrinking (for setting handrails)	"Wall-Nu" (Trowel Mix), by Steelcote Mfg. available locally at Florida Wire and Rigging Works, Inc., "Five Star" by U.S. Grout Corp., or equal, available from Coastal Construction Products.
2.45	Exhaust fan (for dry wells)	See Specification Section 15860
2.46	Expansion anchors and shields	Redhead by ITT Phillips Drill Division or approved equal.
2.47	Fiberglass bar grating	Polyester I-beam, 1-1/2 inch bars for 24-inch span with uniform loading, spaced 1-3/16 inch O/C. Cross bars spaced 6-inch O/C. As manufactured by McNichols Fiberglass Co., or approved equal.
2.48	Fill Cap (emergency pump out connection to force main)	4", lock-type, OPW 634-TT with 4 x 4-inch adaptor, OPW 633-T, by Dover Corp., or equal.
2.49	Flange coupling adapters	Smith-Blair, Dresser.
2.50	Flanged joint material	ANSI sized and approved, full faced 1/8 inch thick neoprene (for sewer) SBR (for water) gaskets and hot-dip galvanized bolts and nuts (except as otherwise specified for a particular service). Properties of gaskets to conform with ANSI/AWWA C111/A221.11. Bolts and nuts hot dip galvanized steel properly sized for ANSI Standard Class 125 flanged joints.
2.51	Flexible couplings (Compression type, if required during installation).	Compression type sleeve Dresser Style 38, Baker, or equal, compatible with pipe dimensions and service, and furnished complete with grade 27 gaskets and 316 stainless steel bolts and nuts.
2.52	Flexible connections, (stainless steel)	Stainless steel bellows type with flanged connections as manufactured by Ram-Tech Sales, Inc., Shreveport, LA, or approved equal.
2.53	Floor drain with strainer 4-inch (if required)	Adjustable body 30604-64 Josam with adjustable Super-Flow strainer, Bronze Top finish.
2.54	Gasket lubricant	Vegetable soap lubricant as recommended by the pipe, valve or gasket manufacturer for

		installation of pipe in subaqueous trench.
2.55	Gauges - pump discharge	0-60 psi range, Kunkle, Style G1110, case type N or equivalent by John C. Ernst, or Ashcroft with diaphragm seal.
2.56	Gauges - pump suction	0-15 psi range, Kunkle, Style G1130, case type N with diaphragm seal, 4-1/2 inch dial size. Gauges shall be furnished by the manufacturer supplying the diaphragm seals assembled as a unit.
2.57	Gauges - Seal water pump	Kunkle, Style G1110, Case Type N, or equivalent by John C. Ernst, 0-60 psi range, 3-1/2 inch face.
2.58	Gauge cock	Bronze gauge cock Crane No. 744 equivalent by Stockam.
2.59	Gravel for venturi, valve or other pit (where required on Plans or herein)	Gravel shall be locally obtained from a fresh water source, free of deleterious matter and graded from 3/4 to 2-1/2 inches in size.
2.60	Grout for sealing between pipe and wall	Non-shrink, hydraulic cement grout. "Waterplug" by Thoro System Products.
2.61	Grout for boring and jacking	Portland cement-sand mixture. Type I (for water) Type II (for sewer) Portland cement and sand fineness that 100 percent will pass a standard 40-mesh sieve. Grout shall not contain greater than one part sand to one part cement.
2.62	Guard Post for hydrants	Galvanized steel pipe, Sch. 40, concrete filled. See Std. Detail 4.5
2.63	Hose bibbs	3/4" bronze, w/vacuum breakers where required by S. Fla. Building Code, American Valve Co., Fig. 76
2.64	Hose Clamps	All stainless steel, worm-gear type, Nos. 30032, 300188, by Breeze Corp, Inc. Hex head Type 316 Stainless Steel Series "68" Hy-Gear by Ideal
2.65	Hose, sump pump	2-inch I.D. Buna-N, "Plant Master" No. 119B by Gates.
2.66	Insulation guide support	1/2-inch insulation protection shield shall be ITT Grinnel, Fig. 167, or approved equal.
2.67	Insulation roll support	Pipe covering protection saddle shall be ITT Grinnel, Fig. 164, or approved equal. 20- inch adjustable roller stand with base plate shall be

		ITT Grinnell, Fig. 274, or approved equal.
2.68	Meter Box for Water Service	Per Department Standard Detail WS 2.10, by U.S. Precast, or approved equal
2.69	Meter Couplings	1-inch brass, NSF 61 Certified, Brass, straight, meter nut x pack joint or grip joint, Ford, Mueller or approved equal.
2.70	Meter Couplings	1-1/2 inch & 2-inch brass "Loc-Pak" by Ford Meter Box Co.
2.71	Neoprene pad (60 Durometer)	Neoprene Bearing Pad "Servicized" by W. R. Grace Co. Code No. 3340.
2.72	Neoprene (compressible pad)	Acmasel by Acme Highway Products, Corp., Amherst, N.J.
2.73	Oils and Lubricants	Type, quality and quantity as recommended by manufacturer of machinery or equipment.
2.74	Paint - Zinc rich for galvanized items with minor damage (if approved by the Engineer)	Dry galve by Force Chemical Division, American Soldering and Flux Co.
2.75	Paint, for guard post and fire hydrant repairs if necessary	Neutralizer – 1 coat Sherwin Williams Galvanized iron primer, B50 WZ1. Finish paint - 2 coats Sherwin Williams Industrial Enamel OSHA yellow B54 Y 37
2.76	Paint, bituminous	Bitumastic No. 300M and Bitumastic No. 50, Kop-Coat Co.
2.77	Pea Rock	Local washed rock, 100% passing 1-inch mesh and retained on 1/4-inch mesh.
2.78	Pipe clamps	Hot-dipped galvanized steel.
2.79	Pipe straps (2-inch by 3/8-inch)	AISI Type 316 stainless steel with 3/8-inch diameter stainless steel bolts.
2.80	Pipe straps for Vent Pipe	Galvanized 2-inch No. 3039T19 by McMaster-Carr
2.81	Pipe supports (where required)	Aluminum Strut Channel 1 5/8-inch X 1 5/8-inch unistrut,
2.82	Pipe support (other types)	Fabricated as shown on the Plans, ASTM A36/A36M-90 steel, hot dip galvanized after fabrication.
2.83	Pipe Hanger, Clevis Type (where required)	Adjustable clevis, carbon steel, galvanized, ITT Grinnell Fig. 260.

2.84	Pipe Support, Rod Attachment (where required)	Forged Steel Clevis Type with pins. ITT Grinnell Fig. 299.
2.85	Polyethylene encasement material for main and line valves	Virgin polyethylene material for ductile iron conforming to ANSI/AWWA C-105/A21.5-88, Type I Class C, extruded tube formed with approved polyethylene adhesive tape. Shall be 0.008-inch (8-mil) thick minimum and conform with WASD Std. Detail A-9.
2.86	Polyethylene sheet for vapor barrier and for use with concrete anchors	.060-inch (6-mil), "Visqueen" by Ethyl Corp., or approved equal. (See Std. Detail GS 1.1)
2.87	Polysulfide Rubber Sealant	Hornflex-L by W.R. Grace and Co.
2.88	PVC double bell repair couplings, No-stop (sleeves)	ASTM Standard D3034 and Section UC-250.
2.89	PVC pipe and fittings (for sewer lines and service laterals)	See Specification Section Section UC-250.
2.90	PVC double bell transition couplings or adapters PSM SDR-35 PVC Sewer Pipe to ductile-iron or AWWA C900 CI-PVC Pressure Pipe	ASTM Standard D3034 and Section 15105-2.07, herein for fittings.
2.91	Riprap	Sand-cement in burlap sacks, well mixed, in the proportion of 5:1. The sacks shall absorb moisture to set-up in the position placed.
2.92	Roofing felt (miscellaneous)	Standard 30-pound asphalt impregnated felt, ASTM Standard D226-88.
2.93	Restrained Joint Connectors	"Megalug" or approved equal. (May only be used where shown on the Plans)
2.94	Sand for bedding - copper tubing	Clean white masonry sand.
2.95	Sand for Casing	Such fineness that 100% will pass a standard 4-mesh sieve.
2.96	Sealant for concrete joints	Dow Corning 888 Silicon Joint Sealant with 3/8-inch Dia. Expanded closed-cell polyethylene foam backer rod or approved equal.
2.97	Service Insulator Assembly	Nylon dielectric bushing with bronze coupling-female I.P. thread by flared copper Ford Meter Co, Inc.
2.98	Service Saddle – Double Strap	Conform with AWWA C800, NSF 61 Certified, Copper alloy 85-5-5-5 body per ASTM B62 & B584, Gasket Buna N, Straps of silicon bronze. Ford Meter Box Co. 202B, James Jones #J-979

		or approved equal.
2.99	Service Saddle – Single Strap	Conform with AWWA C800, NSF 61 Certified, Copper alloy 85-5-5-5 body per ASTM B62, Gasket Nitrile, Straps of silicon bronze. Mueller Co. H-10475 H-10480 or approved equal.
2.100	Service terminal fittings _ single	One inch lock wing style valve, drilled for wire sealing, Cat. No. KV23-444W Ford Meter Box Co. or Cat. No 14255, Mueller Co.
2.101	Service terminal fittings - dual	One-inch branch valve assembly, with standard 7½-inch spacing between outlet centers, drilled for wire sealing, Cat. No. UV23-42W Ford Meter Box Co. or one inch branch connection with standard 7½-inch spacing between outlet centers Cat. No. H-15362, fitted with angle stops for 5/8-inch meters, drilled for wire sealing, Cat. No. H-14265, (3/4" Inlet) Mueller Co.
2.102	Solder, potable water copper tubing	ASTM B32-89 Alloy grade Sn 94 or Sn 95
2.103	Strainer	3/4-inch with screwed connections and 20 mesh 18-8 stainless steel straining element. Type SY-70, as manufactured by Cash Acme or approved equal.
2.104	Stainless steel screws for ladders	AISI Standard Type 316.
2.105	Stainless steel cable	AISI Type 316 wire rope.
2.106	Stainless steel repair clamps, with stainless steel bolts, PSM SDR-35 PVC sewer pipe to ductile-iron or AWWA C900 CI-PVC pressure pipe	Wide range, single or multiple panel, Style 3121 or 3122, Clow Corporation. Coat with bituminous paint after installation.
2.107	Street elbow (90 Degrees)	150 psi, galvanized, malleable iron, screwed, ANSI Standard B2.1 threaded (NPT).
2.108	Stop, Angle Meter	For type K copper inlet. START HERE
2.109	Stop, Corporation, 1-inch	For chlorination, testing and 1-inch service connection, AWWA taper thread inlet, copper service thread outlet (Type K copper tubing), 85-5-5-5 brass alloy, Mueller H-15000, Ford F-600 or approved equal.
2.110	Stop, Corporation, 1 ½ x 2-inch	For 2-inch services, ARV's, AWWA taper thread inlet, Iron Pipe Thread Outlet, 85-5-5-5 brass alloy, Mueller H-10003, Ford FB-800-6, or approved equal.
2.111	Stop, Curb, ¾-inch	For copper thread one side, inside iron pipe thread other side, 85-5-5-5 brass alloy, Mueller H-15175, Ford B21-333W or approved equal.

2.112	Stop, Curb, 1-inch	For inside iron pipe thread both sides, or flare copper 1 side and inside Iron Pipe Thread other side. 85-5-5-5 brass alloy, Mueller H-15175, Ford B21-444 (copper x iron pipe), Mueller H-10201, Ford B11-444 (inside iron pipe thread both sides) or approved equal.
2.113	Stop, Curb, 1 ½-inch	For inside iron pipe threads both sides, 85-5-5-5 brass alloy, Mueller H-10255, Ford B11-666, or approved equal.
2.114	Stop, Curb, 2-inch	For inside iron pipe threads both sides, 85-5-5-5 brass alloy, Mueller H-10255, Ford B11-666, or approved equal. Mueller H-10255, Ford B11-777 or approved equal.
2.115	Suction Bend	Cast iron, flange and flare, long radius 90-degree bend, US Pipe and Foundry Co.
2.116	Tread Plate	¼-Inch galvanized steel (raised checkered design)
2.117	Threaded rods	½-inch, 5/8-inch, and 3/4-inch hot-dip galvanized steel.
2.118	Tie rods	Threaded each end, hot-dip galvanized steel, with galvanized nuts, washers, and eye bolts. The eyebolts shall be Star National Products, Figure No. 7.
2.119	Timber skids and block	Wolmanized pressure-treated Southern Pine at 2.5 pounds per cubic foot retention. Skids and blocking shall be size so that the top of the bells or restrained joints of the carrier main will be two inches or less below the inside top of the casing pipe.
2.120	Turnbuckles	Grinnell Fig. 230, hot-dip galvanized
2.121	U-bolts (galvanized)	Hot-dip galvanized steel
2.122	U-bolts (stainless)	AISI Type 316 stainless steel.
2.123	Vent Cap	2-inch, OPW-63, by Dover Corp.
2.124	Valve (Foot)	1-inch, double poppet, bronze, OPW 92 by Dover Corp.
2.125	Valve boxes and covers	See Standard Details and Section 05550.
2.126	Wall pipes (cast iron)	Clow F-1400 series, American Cast Iron or equal, flange and flange or flange and plain end, or bolted mechanical joint, as required, or as shown on the plans. Length to fit wall thickness.

2.127	Wall Sleeves for Pipe 4" and Smaller	Schedule 40, hot-dip galvanized steel pipe, cut flush with face of wall or floor and reamed.
2.128	Wall Sleeves for Pipe larger than 4-inches	Cast iron, sized as shown on the Plans, conforming to AWWA Standards, Class "D" pattern, with intermediate flange.
2.129	Water proofing system (where required by the Plans)	"Penecrete" cementitious water proofing system at joint and 2-inches of "Penetron" all around joint area, mixed and applied as required by the product manufacturer, International Coating Systems, Inc. - Danko Sales, Inc. (404)922-3351 or approved equal.

Note: All metal underground piping for this project shall be encased in virgin polyethylene

2.130 CASTINGS (See Section 05550)

A. General:

- 1) Materials used in the manufacture of the castings shall conform to ASTM Standard A48, "Gray Iron Castings", for Class 30 iron. Manhole and valve box covers shall have a roadway or pedestrian type surface as required by location, machined mating surfaces and shall be non-rocking.
- 2) Unless otherwise specified, castings shall be as manufactured by U.S. Foundry and Manufacturing Corp., Neenah Foundry, or approved equal.

B. Valve Boxes and Covers:

Valve boxes and covers shall be Department No. 52 or No. 53 in accordance with the Standard Details. Valve box covers shall be cast labeled with the letter "S". The foundry and country of origin shall be cast on the bottom of the covers.

C. Fill Cap Manhole:

Fill cap manhole shall be 12-inch, cast iron with rubber gasket, type OPW 104-A by Dover Corp., or approved equal.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 15080**HORIZONTAL DIRECTIONAL DRILLING****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. The work specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling method of installation, also commonly referred to as directional boring or guided horizontal boring. This work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration.

1.02 RELATED SECTIONS

- A. Section 15060 - Piping and Fittings
- B. Section 15070 - Jacking and Boring

1.03 SUBMITTALS

- A. The Contractor shall furnish the Engineer of Record with five copies of his site surface and sub-surface (soil borings) examination data prior to starting work. The Engineer of Record and the governing authority will analyze this information in conjunction with the equipment and methods specified below to see if any changes are required. However, no changes will be permitted unless specifically authorized in writing by the Engineer of Record and the governing authority.
- B. Work Plan: Prior to beginning work, the Contractor must submit to the Engineer of Record a work plan detailing the procedure and schedule to be used to execute the project. The work plan should include a description of all equipment to be used, down-hole tools, a list of personnel and their qualifications and experience (including back-up personnel in the event that an individual is unavailable), list of subcontractors, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), traffic control plan (if applicable), an environmental protection plan and contingency plans for possible problems. Work plan should be comprehensive, realistic, and based on actual working conditions for this particular project. Plan should document the thoughtful planning required to successfully complete the project.
- C. Equipment: Contractor shall submit specifications on directional drilling equipment. Equipment shall include but not be limited to: drilling rig, mud system, mud motors (if applicable), down-hole tools, guidance system, rig safety systems. Calibration records for guidance equipment shall be included. Specifications for any drilling fluid additives that Contractor intends to use or might use shall be submitted.
- D. Material: Specifications on material to be used shall be submitted to Engineer of Record. Material shall include the pipe, fittings and any other item which is to be an installed component of the project.

- E. The Contractor shall furnish the Engineer of Record with copies of his site surface and sub-surface (soil borings) examination data prior to starting work. The Engineer of Record will analyze this information in conjunction with the equipment and methods specified below to see if any changes are required. However, no changes will be permitted unless specifically authorized in writing by the Engineer of Record.
- F. The Contractor shall perform directional drilling in accordance with an approved drilling method. The drilling method and sequencing of the drill shall be submitted by the Contractor at the scheduled pre-construction meeting. The Contractor shall also submit, for approval, the proposed layout drawing, drilling method, along with his proposed crossing(s) configuration, including entry and exit angles, radius of curvature, and entry and exit points.

1.04 QUALITY ASSURANCE

- A. All work performed within the right-of-ways of Florida Department of Transportation (FDOT), South Florida Water Management District, railroad company or other governing agencies' right-of-ways shall comply with all requirements and conditions of the governing authority, permit requirements and all requirements and conditions of these specifications.
- B. The requirements set forth in this document specify a wide range of procedural precautions necessary to ensure that the very basic, essential aspects of a proper directional bore installation are adequately controlled. Strict adherence shall be required under specifically covered conditions outlined in this specification. Adherence to the specifications contained herein, or the Engineer of Record's approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the project.
- C. The Contractor shall haul, string, weld, coat field joints and hydrostatically test the pipeline sections. X-ray services shall be provided for all welds. The Contractor shall provide adequate security and shall be responsible for the integrity of the pipe section until after the pullback and final test of the pipeline.
- D. The Contractor shall assume all responsibilities for its permittee while complying with all FDOT; railroad company, where applicable, and governing authority requirements having jurisdiction over their work. The Department reserves the right to enforce any and all requirements.

PART 2 - PRODUCTS

2.01 GENERAL EQUIPMENT

- A. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pullback the pipe, a drilling fluid mixing, delivery and recovery system of sufficient capacity to successfully complete the crossing, a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be re-used, a guidance system to accurately guide boring operations, a vacuum truck of sufficient capacity to handle the drilling fluid volume, trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials, and spare parts on hand

to maintain the system in good working order for the duration of this project.

2.02 DRILLING SYSTEM

- A. Drilling Rig: The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm which automatically sounds when an electrical current is detected.
- B. Drill Head: The drill head shall be steerable by changing its rotation and shall provide the necessary cuffing surfaces and drilling fluid jets.
- C. Mud Motors (if required): Mud motors shall be of adequate power to turn the required drilling tools.
- D. Drill Pipe: Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

2.03 GUIDANCE SYSTEM

- A. A Magnetic Guidance System (MGS) or proven gyroscopic system shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at all depths up to one hundred feet and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate to ± 2 percent of the vertical depth of the borehole at sensing position at depths up to one hundred feet and accurate within 1.5 meters horizontally.
- B. The Guidance System shall be of a proven type and shall be operated by personnel trained and experienced with this system. The Operator shall be aware of any magnetic anomalies on the surface of the drill path and shall consider such influences in the operation of the guidance system if using a magnetic system.

2.04 DRILLING FLUID (MUD) SYSTEM

- A. Mixing System: A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid. Mixing system shall continually agitate the drilling fluid during drilling operations.
- B. Drilling Fluids: Drilling fluid shall be composed of clean water and appropriate clay additives. Water shall be from an authorized source with a pH of 8.5 - 10. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal.

The water and additives shall be mixed thoroughly and be absent of any clumps or clods. No potentially hazardous material may be used in drilling fluid.

- C. Delivery System: The mud pumping system shall have adequate capacity of required throughout the project and be capable of delivering the drilling fluid at a constant pressure. The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and conveyed to the drilling fluid recycling system. A berm, minimum of 12 inches high, shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage and recycling facilities.
- D. Drilling Fluid Recycling System: The drilling fluid recycling system shall separate sand, dirt and other solids from the drilling fluid to render the drilling fluid re-usable. Spoils separated from the drilling fluid shall be stockpiled for later use or disposal.

2.05 OTHER EQUIPMENT

- A. Pipe Rollers: Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe.
- B. Pipe Rammers: Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of Engineer.
- C. Restrictions: Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the Engineer prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

2.06 PIPE AND FITTINGS - HIGH DENSITY POLYETHYLENE (HDPE)

- A. High density polyethylene (HDPE) pipe used in directional drilling shall be as specified herein.
- B. Smooth wall high density polyethylene (HDPE) liner pipe shall be a Type III, Class C, Category 5, Grade P 34; PE 3408; as defined in ASTM D1248. Minimum cell classification, as given by ASTM 3350, shall be PE 335434C. Pipe shall meet the standards of ASTM F714, as modified herein, including the "Governmental/Military Procurement" sections. Minimum hydrostatic design basis shall be 1600 psi. In all cases, hydrostatic design basis and pressure rating shall be as determined using the methods of ASTM F714. Pipe of this type shall be butt-fusion welded at joints. All welding of joints shall be in strict conformity with the recommendations of the pipe manufacturer and performed by a firm or individual recommended in writing by the manufacturer.
- C. As a part of the shop drawing submittals, the Contractor shall furnish, sign by a Florida

Registered Engineer, all calculations to determined, the pipe thickness, SDR rating, allowable stresses, in accordance with ASME B31.8, Table A842.22 and recommended coating, as required by the manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

- A. The installation shall be coordinated with the railroad companies, FDOT, municipality in which the job is to be performed, Florida Department of Transportation (FDOT), Florida Department of Environmental Protection (FDEP), Dade County Department of Environmental Resources Management (DERM), Army Corps of Engineers or agency having jurisdiction over the work. The Contractor shall not begin work until he has received permission from the Department and the governing authority to do so. In the event railroad companies, FDOT or governing agency require payment for any services rendered, including services required due to around-the-clock construction, the costs shall be borne by the Contractor.
- B. The Contractor shall obtain all necessary permits required for around-the clock operation from the various agencies having jurisdiction over the work area if he intends to schedule work as such. Additionally, the Contractor shall furnish and install temporary noise barriers as required to comply with noise ordinances of the various agencies having jurisdiction over the work area.

3.02 PERSONNEL REQUIREMENTS

- A. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Each person must have at least 3 years directional drilling experience. A responsible representative who is thoroughly familiar with the equipment and type work to be performed, must be in direct charge and control of the operation at all times. In all cases the supervisor must be continually present at the job site during the actual Directional Bore operation. The Contractor shall have a sufficient number of competent workers on the job at all times to ensure the Directional Bore is made in a timely and satisfactory manner.

3.03 DRILLING PROCEDURE

- A. Site Preparation: Prior to any alterations to work-site, Contractor shall photograph or video tape entire work area, including entry and exit points. One copy of which shall be given to Engineer of Record and one copy to remain with shall for a period of one year following the completion of the project.
 - 1. Work site as indicated on drawings, within right-of-way, shall be graded or filled to provide a level working area. No alterations beyond what is required for operations are to be made. Contractor shall confine all activities to designated work areas.
- B. Drill Path Survey: Entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If Contractor is using a magnetic guidance system, drill path shall be surveyed for any surface magnetic variations or anomalies.

- C. Environmental Protection: Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway, or other area designated for such protection by contract documents, state, federal and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. Contractor shall adhere to all applicable environmental regulations. Fuel may not be stored in bulk containers within 200 feet of any water-body or wetland.
- D. Safety: Contractor shall adhere to all applicable state, federal and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly with a written record of attendance and topic submitted to Engineer of Record.
- E. Pipe: Pipe shall be welded/fused together in one length, if space permits, with welds X-rayed prior to being placed in bore hole. Pipe shall be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of pipe.
- F. Pilot Hole: Pilot hole shall be drilled on bore path with no deviations greater than 5 percent of depth over a length of 100 feet. In the event that pilot does deviate from bore path more than 5 percent of depth in 100 feet, Contractor shall notify Engineer and Engineer may require Contractor to pull-back and re-drill from the location along bore path before the deviation.
 - 1. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, Contractor shall cease drilling, wait at least 30 minutes, inject a quantity of drilling fluid with a viscosity exceeding 120 seconds as measured by a March funnel and then wait another 30 minutes. If mud fracture or returns loss continues, Contractor shall cease operations and notify Engineer. Engineer and Contractor will discuss additional options and work will then proceed accordingly.
- G. Reaming: Upon successful completion of pilot hole, Contractor shall ream bore hole to a minimum of 25% greater than outside diameter of pipe using the appropriate tools. Contractor shall not attempt to ream at one time more than the drilling equipment and mud system are designed to safely handle.
- H. Pull-Back: After successfully reaming bore hole to the required diameter, Contractor shall pull the pipe through the bore hole. In front of the pipe will be a swivel and reamer to compact bore hole walls. Once pull-back operations have commenced, operations must continue without interruption until pipe is completely pulled into bore hole. During pull-back operations Contractor shall not apply more than the maximum safe pipe pull pressure at any time.
 - 1. In the event that pipe becomes stuck, Contractor shall cease pulling operations to allow any potential hydro-lock to subside and shall commence pulling operations. If pipe remains stuck, Contractor shall notify Engineer of Record. The Engineer of Record and Contractor will discuss options and then work will proceed accordingly.
 - 2. The bore pipe will be pulled back in one continuous section and the Contractor must utilize a swivel to minimize the rotation of the product pipe during pull back. The Engineer of Record shall have access at all times to any measuring or gauging devices used for horizontal drill as well as any drilling logs maintained by the Contractor.

3.04 DAMAGED OR IMPROPERLY INSTALLED PIPE

- A. If the pipe or protective coating is damaged before installation or does not meet the specifications it shall be replaced at no expense to the Owner. If the pipe is damaged during installation by the Contractor's operations, is placed at the improper grade or line or cannot be advanced because of an unseen obstruction or any other reason, it shall be abandoned in place, and filled with concrete. After abandoning a pipe, an alternate installation shall be made, as directed by the Engineer of Record. With the exception of pipe that has to be abandoned in place due to unseen obstructions, the cost for abandonment of pipe shall be at the expense of the Contractor. No additional payment shall be made for the pipe, which is abandoned, including dewatering, excavation, drilling etc.

3.05 PIPE TESTING

- A. The Contractor will hydrostatically test the pipe after pullback to ensure its integrity, according to testing specifications. A calibrated pressure recorder shall be used to record the pressure during the test period. This record shall be presented to the Engineer of Record and made available to the Department. The Contractor will supply portable mud tanks or construct temporary mud pits to contain excess drill fluids during construction. Upon completion of the work, the Contractor shall legally dispose of any drill cuttings and excess drill fluids in accordance with DERM regulations. The Contractor shall provide as-built drawings reflecting actual installation.

3.06 SITE RESTORATION

- A. Following drilling operations, Contractor shall de-mobilize equipment and restore the worksite to original condition. All excavations shall be backfilled and compacted to 95% of original density. Landscaping shall be subcontracted to a local professional landscaping company.
- B. In the event that the Contractor must abandon a drill hole before completion of the crossing, the Contractor will seal the bore hole and redrill the crossing at no additional cost to the Department.
- C. In the event that the pipeline becomes lodged and cannot be pulled out of the drilled hole during the installation, the Contractor shall seal the pipe and existing hole. The Contractor shall redrill a pilot hole and again commence the pulling of the pipeline. Cost of the pipe and its welding to replace the portion of the pipe not retrieved shall be borne by the Contractor.

3.07 RECORD KEEPING, AS-BUILTS

Contractor shall maintain a daily project log of drilling operations and a guidance system log with a copy given to Engineer of Record at completion of project. The Contractor shall provide as-built drawings of the completed operation and certified as to accuracy by the Contractor.

END OF SECTION

SECTION 15100**VALVES, GENERAL****PART 1 - GENERAL****1.01 SCOPE**

- A. The Contractor shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, installing, adjusting, and testing of all valves and appurtenant work, complete and operable. For buried valves, the Contractor shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.
- B. The provisions of this Section shall apply to all valves and valve operators called out in the various Sections of these Specifications except where otherwise specified. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other sections of these Specifications.
- C. All valves specified herein shall be furnished with an affidavit from the manufacturer(s) certifying that the valves furnished comply with the applicable provisions of the AWWA specifications, as modified herein. That they were factory tested in accordance with the AWWA Standard Leakage and Hydrostatic Tests as modified herein, with a certified test report furnished to the Department for each valve.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Piping, General
- B. Painting
- C. Equipment General Provisions
- D. Electrical
- E. Valve (by type) Specification Sections

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Codes: All codes, as referenced herein, are specified in Section entitled "Reference Standards." As used herein, "ANSI" denotes the American National Standards Institute; "AWWA", the American Water Works Association; and "ASTM", the American Society for Testing and Materials.
- B. Commercial Standards:

ANSI B16.1

Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.

ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys.
ANSI/ASME B1.20.1	General Purpose Pipe Threads (Inch).
ANSI/ASME B31.1	Power Piping.
ASTM A 36	Specification for Structural Steel.
ASTM A 48	Specification for Gray Iron Castings.
ASTM A 126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
ASTM A 536	Specification for Ductile Iron Castings.
ASTM B 61	Specification for Steam or Valve Bronze Castings.
ASTM B 62	Specification for Composition Bronze or Ounce Metal Castings.
ASTM B 148	Specification for Aluminum-Bronze Castings.
ASTM B 584	Specification for Copper Alloy Sand Castings for General Applications.
ANSI/AWWA C500	Gate Valves for Water and Sewerage Systems.
AWWA C550	Protective Interior Coatings for Valves and Hydrants.

1.04 MANUFACTURER

All valves shall be the product of domestic manufacturing firms which have been engaged in the production of valves for not less than five (5) years.

1.05 QUALITY ASSURANCE

- A. Valve Testing: The Contractor is advised that he is required to furnish all labor, materials and equipment necessary to pressure test each valve furnished by himself or the Department, bi-directionally, prior to installation, to the satisfaction of the Engineer of Record. If the valves are available, the tests shall be performed prior to the start of construction. Otherwise, the tests shall be performed as soon as the valves are available to afford the maximum time for any corrective work required. The Contractor shall include all costs for this requirement under the appropriate Proposal Item(s), no other compensation will be provided.
- B. Bronze Parts: Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B 62.
- C. Provide valves that have the manufacturer's name and valve rating cast in body.

1.06 SUBMITTALS

- A. Shop Drawing: Shop drawings of all valves and operators including associated wiring diagrams and electrical data.
- B. Approved Drawings: The Engineer of Record's drawings, which constitute an integral part of this Contract, indicate the general layout of the complete system. Field verification of scale dimensions on plans is directed since actual locations, distances and levels will be governed by actual field conditions. The Contractor shall also review architectural, structural, and mechanical plans and shall adjust his work to conform to all conditions indicated thereon. Discrepancies shown on different plans, or between plans and actual field conditions, or between plans and specifications, shall promptly be brought to the attention of the Engineer of Record, for a decision. All items not specifically mentioned in the specifications or noted on the drawings, but which can be reasonably assumed as necessary to make a complete working installation shall be included.

PART 2 - PRODUCTS

2.01 VALVES

- A. General: The Contractor shall furnish all valves, gates, valve operating units, stem extensions, operators and other accessories as shown or specified. All valves and gates shall be new and of current manufacture. All non-buried valves, 6-inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes, covers and valve extensions. Valves mounted higher than 6-feet above working level shall be provided with chain operators. All valves shall have a minimum design pressure rating of 150 psi unless otherwise specified elsewhere herein.
- B. Cast iron parts of valves shall meet the requirements of ASTM A126, "Standard Specifications for Gray Iron Castings for Valves, Flanges and Pipe Fittings, Class 'B'." Flanged ends shall be flat-faced and have bolt circle and bolt patterns conforming to ANSI B16.1 Class 125.
- C. All castings shall be clean and sound, without defects of any kind and no plugging, welding or repairing of defects will be permitted. All bolt heads and nuts shall be hexagonal conforming to ANSI B18.2. Gaskets shall be full-face and made of synthetic elastomers in conformance with ANSI B16.21 suitable for the service characteristics, especially chemical compatibility and temperature. Non-ferrous alloys of various types shall be used for parts of valves as specified. Where no definite specification is given, the material shall be the recognized acceptable standard for that particular application.
- D. All buried valves shall be provided with cast-iron valve boxes unless otherwise indicated. The boxes shall conform with Department Standards and be installed perpendicularly, centered around and covering the upper portions of the valve operator. The top of each valve box shall be placed flush with finish grade unless otherwise indicated on the Drawings. Valve boxes shall be as specified elsewhere in this Section.

- E. All buried valves and other valves located below a concrete operating deck or level, specified or noted to be key operated, shall have an operator to finish grade or deck level, non-rising stem, a 2-inch square AWWA nut with skirt, and cover or box and cover, as may be required.
- F. Valve Flanges: The flanges of valves shall be in accordance with Section 15060, "Piping and Fittings."
- G. Gate Valve Stems: Gate valve stems shall be of bronze in accordance with AWWA C515, containing not more than 5 percent of zinc nor more than 2 percent of aluminum.
- H. Protective Coating: Except where otherwise specified, ferrous surfaces, exclusive of stainless-steel surfaces, in the fluid passages of all valves 4-inch and larger shall receive an epoxy coating in accordance with AWWA C550. Flange faces of valves shall not be epoxy coated. The valve manufacturer, shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications. Exterior coating shall be asphalt varnish conforming to Federal Specification TT-C-494A.
- I. Valve Labeling: A label shall be provided on all shut-off valves exclusive of hose bibs and chlorine cylinder valves. The label shall be of 1/16-inch brass or stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve or on the wall adjacent to the valve or as indicated by the Department.

2.02 VALVE OPERATORS

A. General

- 1. All butterfly valves, plug valves over 8-inch size and gate valves installed horizontally shall be furnished with geared operators, provided by the manufacturer. All valves of a particular size and pressure rating by a given manufacturer shall be supplied with the same operator. No variation will be permitted during the contract. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Operator orientation shall be verified with the Department prior to fabrication. If this requirement is not met, changes to orientation shall be made at no cost the Department.
- 2. All operators shall turn counter-clockwise to open. Operators shall have the open direction clearly and permanently marked. Field adjustment and testing of the operators and valves to ensure proper installation and operation shall be the responsibility of the Contractor.

B. Manual Operators

- 1. All manual operators shall be equipped with AWWA square nuts, handwheels or chain drives as appropriate. Some small (6-inch or less) valves may be lever operated if so specified elsewhere herein. Where buried, the valves shall have extensions with square nuts or floor stands as indicated on the Drawings. Valves mounted higher than 6 feet above floor or operating level shall have chain operators with chain terminating 4 feet above operating level.

2. Operation of valves and gates shall be designed so that the effort required to operate the handwheel, lever or chain shall not exceed 40 pounds applied at the extremity of the wheel or lever. The handwheels on valves 14 inches and smaller shall not be less than 8 inches in diameter, and on valves larger than 14 inches the handwheel shall not be less than 12 inches in diameter.
3. Chainwheel operator shall be fabricated of malleable iron with pocketed type chainwheels with chain guards and guides. Chainwheel operators shall be marked with an arrow and the word "open" indicating direction to open. The operators shall have galvanized smooth welded link type chain. Chain that is crimped or has links with exposed ends is not acceptable.

2.03 TORQUE LIMITING DEVICE

Each butterfly valve shall be provided with a torque limiting device designed to protect the actuator and valve parts. The device shall consist of an overtorque protection mechanism enclosed in a hermetically sealed cast iron housing. The mechanism shall be permanently lubricated, and factory set to trip between 200 and 220 ft. lbs. of applied torque. The housing shall have integrally cast, 2-inch AWWA operating nut and matching socket to operate and to fit over the actuator or extension shaft nuts, respectively. The socket shall be provided with a set screw to fit the device. The direction of rotation shall be permanently shown with word and arrow next to the operating nut. The entire device shall be coated inside and out with a 2-part epoxy. The torque limiting device shall be as manufactured by Annspace Controls Company of St. Louis, Missouri, or approved equal.

2.04 FLOOR STANDS

Floor stands shall be cast iron, non-rising stem type with lockable hand wheel operator, valve position indicator and stainless steel or bronze extension stem. Hand wheel shall be lockable in the full open and full closed positions. The floor stand shall be furnished with an armored padlock and six keys. Lock shall be as manufactured by Master, Schlage or equal. Floor stand shall be standard pattern type as manufactured by Clow Corporation, or equal.

2.05 VALVE BOXES

Cast iron valve boxes shall be provided for all valves installed underground. All valves boxes shall be No. 2 or 3 (for water) and No. 52 or 53 (for sewer) in accordance with Department Standards.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: All work shall be performed by skilled workmen experienced in similar installations. All valves shall be adequately supported by clamps, brackets, straps, concrete supports or other devices as shown or specified. All supports shall be secured to structures by approved inserts or expansion shields and bolts.

- B. All valves shall be thoroughly cleaned internally before being installed. Installation of valves shall be done in accordance with construction methods specified in "Pipes and Fittings" Section of these Specifications.
- C. Install valves as recommended by manufacturer.
- D. Install valves so that they are easily accessible for operation, visual inspection and preventive maintenance.
- E. Location of valves and chain operators: Install valves so as to be accessible for operation and free from interferences when operated. Position so that leakage will not contact any electrical equipment that may be located below.
- F. The installation of all underground valves shall include a valve box and riser in accordance with the Details shown on the Plans or in the Standard Details for the various sizes and types of valves to be installed. Riser pipes and valve boxes shall be carefully centered and set flush with the finished grade if in paving, or with the top of the ground if out of paved areas. All valve boxes shall be held in position with concrete as shown on the Plans or in the Standard Details.
- G. Upon completion of the Project, but prior to final acceptance, the Contractor in the presence of the Engineer, shall fully open each valve installed by him, except at connections to existing Department mains. For valves 16-inch and larger, the Contractor, shall count the number of turns required to operate each valve from a completely closed to a fully opened position, and shall paint the number on the bottom of the valve box lid or manhole cover. Valves at connections to existing Department mains shall only be operated by Department forces.

END OF SECTION

SECTION 15102**TAPPING SLEEVES AND TAPPING VALVES****PART 1 GENERAL****1.01 SCOPE**

- A. The Contractor shall furnish and install tapping sleeves and tapping valves, as shown on the Plans and/or as specified herein. All items not specifically mentioned in these specifications or noted on the Drawings, but which can be reasonably inferred as necessary to make a complete working installation, shall be included.
- B. Tapping sleeves, where shown on the Plans, shall fit the existing pipe to be tapped and the Contractor shall determine the outside diameter and type of pipe before ordering the sleeve. Field verification of dimensions is directed since actual locations, distances and levels will be governed by actual conditions. The Contractor shall adjust his work to conform to said field conditions.
- C. The Contractor is responsible for having the work properly scheduled, location excavated in accordance with Trench Safety requirements, pipe restrained, excavation dewatered and all conditions ready for the tap to be made.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 15100 "Valves, General"
Section 15120 "Gate Valves"

1.03 MANUFACTURE

- A. All valves shall be the products of domestic manufacturing firms which have been regularly engaged in the production of valves for at least 5 years. All valves specified herein shall be tested at the factory in accordance with the AWWA Standard Leakage and Hydrostatic Test as modified herein and a certified test report shall be furnished for each valve upon request.

1.04 SUBMITTALS

- A. Shop Drawings: Submit shop drawings for all tapping sleeves and valves not on Pre-Approved products List.
- B. Complete technical data and information on tapping sleeves for pipe other than cast iron shall be submitted to the Department for approval on an individual basis.

PART 2 PRODUCTS**2.01 TAPPING SLEEVES**

- A. Tapping saddles approved for use by the Department are shown on Sheet 6.0 Tapping

Sleeves of the Pre-Approved Product List.

- B. Tapping sleeves with MJ outlets to connect MJ gate valves shall be constructed of 316 stainless steel. This shall apply to both water and sewer applications unless otherwise approved by the Department. These units shall be manufactured of AISI Type 316 stainless steel passivated after welding or Type 316L. Threaded fasteners shall be Type 316 and gasketing shall be Neoprene, EPDM, or Nitrile for sanitary sewer use and SBR for potable water. A standard resilient-seated gate valve shall be attached to the MJ outlet of the sleeve.
- C. Cast Iron tapping sleeves shall be designed to withstand a working pressure of at least 150 psi. Cast iron tapping sleeves shall be used with a flanged tapping valve.
- D. Full size taps (8-inch tap on an existing 8-inch main, 12-inch tap on an existing 12-inch, etc.) main shall be made with a 316 stainless steel tapping MJ outlet sleeve. The inside diameter of the mechanical joint outlet fitting, and branch shall be larger in diameter than nominal to allow the use of a full-size cutter.
- E. Tapping saddles for concrete pipe sewer mains 42-inches and larger may use a fusion bonded epoxy carbon steel saddle with 316 stainless steel straps. Large diameter saddles shall be individually approved by the Department on a case-by-case basis.
- F. Each mechanical joint on the tapping sleeve shall be furnished complete with tee-head bolts and nuts complying with ANSI/AWWA C111/A21.11 "Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings" (latest edition). Tee-head bolts and hex nuts shall be of high strength cast iron. Bolts and nuts to join the two halves of the sleeve together shall be standard carbon steel, hex, or tee-head bolts and nuts which have been galvanized.
- G. The tapping sleeves, including outlet flanges shall be as dimensioned and thicknesses shall be as required by AWWA/ANSI C110/A21.10. The tapping sleeves shall be mechanical joint ended, on the run, and shall have a connecting flange outlet, with centering groove (for all valves size 12-inch and below and for valves above 12-inch if available from the manufacturer), for connecting to the tapping valve. For tapping sleeves with outlets 12 inches and smaller, the connecting flange joint between the tapping sleeve and the tapping valve shall be in compliance with all applicable provisions of MSS Standard Practice SP60, latest revision, as developed and approved by the Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street N.E. Vienna, VA. 22180. For tapping sleeves with outlets larger than 12 inches, the connecting flange must provide a matching fit with tapping valves by other manufacturers.
- H. Each tapping sleeve shall be furnished complete with all necessary split end gaskets, longitudinal gaskets and two-piece (split) steel glands (follower glands held in place by set screws not acceptable). Gasket shall be shipped separately in suitable protective containers. Material for split end gaskets shall conform to ANSI/AWWA Standard C111/A21.11. Material for longitudinal gaskets shall be rubber conforming to ANSI/AWWA Standard C111/A21.11.
- I. Each tapping sleeve shall be furnished complete with all necessary split end gaskets, longitudinal gaskets and two-piece (split) steel glands (follower glands held in place by set

screws not acceptable). Gasket shall be shipped separately in suitable protective containers. Material for split end gaskets shall conform to ANSI/AWWA Standard C111/A21.11. Material for longitudinal gaskets shall be rubber conforming to ANSI/AWWA Standard C111/A21.11.

- J. The sleeves shall be suitable for use with ductile iron pipe conforming to ANSI/AWWA Standard C151/A21.51, "Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids", with wall thickness and outside diameter as specified in Table 51.4 and 51.5. The sleeves shall also be suitable for use with other cast iron pipe with differing outside diameters and other types of pipe where required.
- K. Each tapping sleeve shall be Factory Hydrostatically tested on pipe to verify proper fit and weld integrity with zero leakage.

2.02 TAPPING VALVE

- A. Resilient-seated tapping valves shall have a mechanical joint outlet end conforming to ANSI/AWWA Standard C111/A21.11-00, "Rubber Gasket Joints of Ductile-iron and Gray-Iron Pressure Pipe and Fittings," for connection to new piping and a flange inlet with centering ring, for connecting to the tapping sleeve.
- B. The tapping valves shall conform to the requirements listed for gate valves, including bypass valve when applicable, shall be furnished complete with all joint materials. Joint materials for the flanged inlet shall be ANSI-sized and approved and shall include a 1/8-inch thick full-faced neoprene gasket, and hot dipped galvanized carbon steel bolts and nuts with internal threads tapped or retapped after galvanizing. The flange inlet gaskets shall conform to the gasket material and property requirements set forth in ANSI/AWWA Standard C111/A21.11-00. All gaskets and seals shall be neoprene, Buna-N, or approved equal, but not natural rubber. The mechanical joint outlets shall include the necessary joint materials conforming to the requirements of joint materials for mechanical joint ended gate valves as specified in Section 5.07.3 "Valves - Resilient Seated Gate Valves." Bolt holes in the flanges of the mechanical joint shall be equally spaced and shall straddle the vertical centerline. Gaskets shall be shipped separately in suitable protective containers. Resilient-seated tapping valves shall be as manufactured by U.S. Pipe and Foundry Co., American Flow Control, Mueller, or approved equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Taps 20-inches and smaller for water mains will be made by Department forces. Taps of any size into concrete mains shall be done by a tapping specialist with credentials acceptable to the Department.
- B. Taps of any size into concrete or PCCP water mains shall be made by a tapping specialist with credentials acceptable to the Department.

- C. Tap of any size to sewage force mains shall be made by a tapping specialist with credentials acceptable to the Department.
- D. The tapping specialist shall be from any of the following:
 - a. EA Tapping Services
 - b. Hydra-Stop, a division of ADS LLC.
 - c. Rangeline Tapping Service, Inc.
 - d. T.D.W. Services Inc.
 - e. or approval equal
- E. The Contractor shall notify the Engineer at least seven days in advance of when he will be ready to make the connection and shall have the tapping valve installed on the existing main with the new equipment satisfactory pressure tested and sufficient excavated work areas prepared for the Department forces when they arrive to make the tap.
- F. The Contractor shall furnish and install a mechanical joint plug on the free end of the tapping valve, and shall pressure test the tapping sleeve and valve after installation on the main, but prior to tapping operations. No leakage will be permitted at any joint in either the tapping sleeve or tapping valve. The tapping sleeve and valve shall be filled with water and then pressurized at design test pressure. Duration of the test shall be determined by the Department. The test shall be conducted in the presence of the Engineer, who will notify Department forces of the satisfactory conclusion of the test and arrange a definite time and date for them to arrive at the site to make the tap. No leakage shall be permitted at any joint in either the tapping sleeve/saddle or valve.
- G. The tapping valve requires the installation of a cast iron riser pipe complete with valve box and cover, centered over the operator, and set in concrete.
- H. All necessary sheeting, shoring, dewatering, excavation, backfill and compaction, surface repairs, and other items and work appurtenant to or incidental to the work shall be performed by the Contractor.
- I. For Concrete mains the tapping saddle shall be tested after installation at a pressure of 5 psi lower than the operating pressure of the pipeline at the time of the test. A pressure reading shall be taken from an air release valve prior to performing the pressure test on the saddle.
- J. The Contractor shall pressure test the tapping sleeve and valve after installation on the main, but prior to tapping operations. The test shall be conducted in the presence of the Department's Inspector. No leakage will be permitted at any joint in either the tapping sleeve or tapping valve.
- K. When the invert of the tapping valve is under water, interlocking sheeting and

tremie concrete shall be used, unless otherwise approved by the Department. Seal the perimeter of all pipes passing through the sheeting below the water table. Only minimum seepage will be permitted. The cofferdam must be designed and sealed by a State of Florida, P.E. No work will be permitted within the cofferdam until it is demonstrated to the Department to be dry. Approval to remove the initial water in the cofferdam must be obtained from the Department and other governmental agencies jurisdiction over the work.

3.02 TAP BY DEPARTMENT FORCES

- A. The Contractor shall notify the Department at least 48-hours in advance of when he will be ready to make the tap and shall have the tapping sleeve and valve installed on the existing main and satisfactorily tested as specified below, with a sufficient excavated work area prepared for the Department forces when they arrive to make the tap.
- B. The Contractor shall furnish and install a mechanical joint plug on the free end of the tapping valve, and shall pressure test the tapping sleeve and valve after installation on the main, but prior to tapping operations. No leakage will be permitted at any joint in either the tapping sleeve or tapping valve. The tapping sleeve and valve shall be filled with water and then pressurized to the required test pressure. Duration of the test shall be determined by the Department. The test shall be conducted in the presence of the Department's Inspector, who will notify Department forces of the satisfactory conclusion of the test and arrange a definite time and date for them to arrive at the site to make the tap.
- C. A crane or other suitable equipment as approved by the Department, shall be furnished by the Contractor to unload the tapping machine, position it in the trench for bolting to the valve, and to reload it after the tapping operation has been completed.
- D. Department forces will connect the tapping machine to the valve and disconnect it after the tap is complete; however, the Contractor shall furnish suitable devices or material to support the machine in the trench for proper alignment, as required by the Department. The Contractor shall aid the Department's forces whenever and to whatever extent necessary for the tapping operation to be performed efficiently and without any undue time lost.

3.03 TAPPING BY NON-DEPARTMENT FORCES

- A. The Contractor shall comply with all applicable provisions of Subsections 3.01 and 3.02, above, including installation and pressure testing of tapping sleeve and valve in the presence of the Department's Inspector.
- B. Since cutting equipment used for this type of installation is of a special design, the Contractor shall make provisions for furnishing a tapping specialist to perform actual tapping operation. The qualifications of the tapping specialist shall be forwarded to the Department prior to any tapping work. The Contractor shall also furnish all incidental equipment necessary to operate the tapping machine and perform a complete operation to the satisfaction of the Engineer.

- C. The tapping valve shall be installed in the horizontal position with the operator in the vertical position and shall include a valve box cover. Tapping valves shall be left in the closed position.
- D. All tapping operations shall be conducted under the direct supervision of the previously approved tapping specialist. All operations shall have prior approval of the Department.

3.02 RECORD DRAWINGS

- A. Record Drawings shall be prepared in accordance with Section 01720.
- B. The location and elevation for each valve, tapping outlet, fitting, service line and other appurtenances along the pipeline shall be recorded by the Contractor's Florida Registered Surveyor and Mapper.

END OF SECTION

SECTION 15130

MISCELLANEOUS VALVES

PART 1 GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install miscellaneous valves as required, complete and operable, including all appurtenances and accessories.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15100 - Valves, General

PART 2 PRODUCTS

2.01 AIR RELEASE VALVES (MANUAL) AND FLUSHING VALVE OUTLETS

- A. The air release valve and flushing valve assemblies shall be installed in accordance with the details shown in the Department Standard Details. The following products shall be used to construct the assemblies:

Corporation Stops	1-1/2 inch, ballcorp corporation stop, AY McDonald, Ford, Cambridge Brass or approved equal (rating of 300 psi)
Angle Valves for Manual Air Release	2-inch straight ball valve with lever, see Std. Detail WS 1.60
Flushing Valve Outlet Angle Valve	2-inch Bronze angle valve with lever, see Std. Detail WS 1.61
2-inch Schedule 80 PVC	Schedule 80 PVC threaded at both ends

- B. Taps into ductile iron pipe for air release and flushing valve assemblies shall be AWWA Tapered thread only, and the Contractor shall provide suitable equipment for this purpose as approved by the Engineer. After the tap has been made, and the corporation stop installed on a pipe conveying potable water, the inside of the pipe around the stop and the exposed exterior surfaces of the stop shall be heavily coated with Carboline Super Hi-Gard 891 White 1898 or approved equal.
- C. The installation of air release valves shall include excavation, tapping the ductile iron pipe, corporation stop, angle valve, PVC pipe and fittings, complete with valve boxes and covers, set in concrete, backfilling and compaction, and all other appurtenant items and work in accordance with the Department Standard Detail WS 1.60.
- D. The installation of the flushing valve outlets shall include excavation, tapping the ductile

iron plug, angle valve, PVC pipe and fittings, concrete thrust block, complete with valve boxes and cover, set in concrete, backfilling and compaction, and all other appurtenant items and work in accordance with the Department Standard Detail WS 1.61.

2.02 SEWAGE AUTOMATIC AIR RELEASE VALVE

- A. Sewage automatic air-release valves shall be of the type that automatically releases accumulated air, gas, or vapor under pressure during system operation and shall be of the size shown on the approved Plans or Standard Details. The internal mechanism shall be the compound lever type to permit the valve to open under pressure to vent pockets of entrapped air, gas, or vapor as they accumulate. The compound mechanism shall be activated by a stainless-steel concave float to lift the Buna-N needle or orifice button to control the air release orifice. Linkage shall be stainless steel. The air release valves shall be designed for a maximum working pressure of 150 psi. The valves shall be supplied with a 2-inch stainless steel shut-off ball valve, blow-off assembly and a ½-inch quick-disconnect back flushing connection with shut off valve. The valve shall have a straight flow body with automatic orifice, corrosion resistant internal mechanisms that include a stainless-steel float rod and inlets to enable back flushing and drainage.
- B. Automatic air release valves (for sewage) are listed in the MD-WASD Pre-Approved Products List Sheet 4.7.

2.03 BRONZE BALL/CORPORATION STOPS, 2 INCHES AND SMALLER, FOR WATER SERVICE

- A. Corporation stops shall be bronze with male inlet iron pipe threads and female outlet iron pipe threads and shall conform to AWWA C800. Components in contact with water shall be bronze (ASTM B584, Alloys C89833 or C89836). Components not in contact with water shall be bronze (ASTM B62 or ASTM B584, Alloys C83600, C89833, or C89836). Bronze alloys having a maximum lead content of 0.25%, a maximum zinc content of 7.0%, and a minimum copper content of 80% may be substituted for the bronze alloys specified above. Minimum pressure rating shall be 300 psi. Stops shall be Ford Ballcorp Type FB 1700, A.Y McDonald, or equal. Stops shall have an outlet fitting to adapt from iron pipe thread to copper tubing.
- B. Corporation stops are listed in the MD-WASD Pre-Approved Products List Sheet 8.3.

2.04 BRONZE ANGLE METER STOPS FOR WATER SERVICE

- A. Angle meter stops shall be bronze and marked NL for no lead. Components in contact with water shall be bronze (ASTM B584, Alloys C89833 or C89836). Components not in contact with water shall be bronze (ASTM B62 or ASTM B584, Alloys C83600, C89833, or C89836). Bronze alloys having a maximum zinc content of 7.0%, and a minimum copper content of 80% may be substituted for the bronze alloys specified above. Minimum pressure rating of the Meter Valve shall be 300 psi.
- B. Meter Valves for Water Service are listed in the MD-WASD Pre-Approved Products List Sheet 8.5.

2.05 STAINLESS STEEL BALL VALVES – USED FOR AUTOMATIC AIR RELEASE VALVES

- A. Ball valves used for sewer applications shall be stainless steel full port type with threaded NTP ends. The valve shall be designed to ASME B 16.34 with a locking lever. The minimum pressure rating shall be 150 psi. Valve materials shall be as follows: valve body, gland, seat ring, stem, and ball of AISI Type 316 stainless steel. Bushing, packing, seat ring gasket, and seat shall be TFE. Thrust washer shall be glass-filled TFE. Stainless steel ball valve shall be FNW 2PC Full Port 1000 CWP (Ferguson Supply Brand) or approved equal.

2.06 FULL PORT THREADED BRONZE BALL VALVES 2 INCHES AND SMALLER

- A. Ball valves, 2 inches and smaller, for water service shall have a pressure rating of at least 600 psi WOG at a temperature of 100°F. Provide full port ball and body design. Valves shall comply with MSS SP-110 and constructed of bronze. Bronze alloys having a maximum lead content of 0.25%, a maximum zinc content of 7.0%, and a minimum copper content of 80% may be substituted for the bronze alloys specified above. Valves shall have threaded ends (ASME B1.20.1), non-blowout stems, and have plastic-coated lever actuators. Provide locking lever handle.
- B. Manual air release valves for water shall use a 2-inch straight ball valve with lever.

2.07 PLASTIC BALL VALVE

- A. Plastic ball valves shall be used at all PVC pipe installations where required and be made of polyvinyl chloride (PVC). All valves shall have manual operators, unless otherwise specified or shown.
- B. Construction: All plastic ball valves shall have union ends or flanged ends to ANSI B.16.5, class 150, for easy removal. The balls shall have full size ports and Teflon seats. All body seals, union O-ring seals, and stem seals shall be Viton. The valves shall be suitable for a maximum working non-shock pressure of 150 psi at a temperature of 105°F. Body, ball, and stem shall be PVC conforming to ASTM D1784, Type 1, Grade 1. Seats shall be Teflon. O-ring seals shall be Viton. Valve ends shall be of the double-union design. Ends shall be socket welded except where threaded or flanged-end valves are specifically shown in the drawings. Valves shall have handle for manual operation.
- C. Suppliers or Equal: NIBCO Inc., (Chemtrol), Watts Regulator Company, ITT Engineered Valves.

2.08 PRESSURE AUTOMATIC AIR RELEASE VALVE

- A. The pressure automatic air-release valves shall be installed at locations selected by the Engineer of Record to automatically release accumulated air and other gases with the line under pressure. The internal mechanism shall be the compound lever type to permit the valve to open under pressure to vent pockets of entrapped air or gas as they accumulate. Valve shall be selected with orifice sized for venting at an acceptable discharge rate over the entire pressure range the main will be operated. It shall have sealing faces of an adjustable BUNA-N rubber valve and stainless steel. Valves which use a needle valve to seal the orifice shall not be acceptable. Valve shall have a 2-inch NPT screwed inlet connection and shall have cast iron body with stainless steel float and inner mechanisms. For valves where bolts thread into the housing (i.e. bonnet-to-body bolts), bolts shall be stainless steel. Valves shall be supplied with a 1-inch vacuum check

valve on the outlet to eliminate the possibility of air entering the system when the pressure decreases or if a vacuum is drawn. The valves shall also be supplied with a 2-inch bronze isolation shut-off ball valve.

2.09 SERVICE SADDLES

- A. Install service saddles for taps into 6-inch and smaller ductile iron mains. Service pipe saddle shall fit to the maximum O.D. of the saddle's range. When the saddle is used on pipe to the minimum pipe size of the range, the saddle shall extend 180 degrees around the pipe. Straps shall have ends chamfered and be provided with Class 2 fit, National Coarse Threads. Valve gaskets shall be self-sealing neoprene.
- B. Saddles are listed in the MD-WASD Pre-Approved Products List Sheet 7.0.

2.10 SMALL PRESSURE REDUCING VALVES (AIR AND WATER)

- A. General: Small air and water pressure reducing valves shall be of the spring-loaded diaphragm type with a minimum pressure rating of 250 psi, with bronze body, nickel alloy or stainless-steel seat, and threaded ends. Each valve shall be furnished with built-in or separate strainer and union ends.

2.11 GLOBE VALVES

- A. The globe valves for pipe 3 inches and smaller shall be handwheel operated, shall have ends threaded to American Tapered Pipe Thread (NPT) Standard, shall be designed for 150-pound working pressure and shall be bronze body equal to Crane Company No. 1, Nibco Inc., or approved equal.

2.12 GATE VALVES (SMALL)

- A. Gate valves, smaller than 3-inches in size, unless otherwise noted on the approved Plans, shall be minimum 125 psi, bronze body, double disc, rising stems with heavy duty bronze handwheels. Valve shall have a full bore able to allow passage of a drill of the nominal valve size and be used in place of a corp. stop for tapping the main. James Jones Co. Model J-372, Stockham, Bermaid or approved equal. Ends should be as shown or indicated on the Plans. Each valve shall open by turning the handwheel counterclockwise. Valves shall be designed for at least 125 psi working pressure. Valves with reduced bores or appreciably lighter in weight than those specified will not be acceptable.
- B. See Section 15120, "Gate Valves", for gate valves not specified above.

2.13 PRESSURE RELIEF VALVE

- A. The pressure relief valve shall maintain constant upstream pressure by by-passing or relieving excess pressure and shall maintain close pressure limits without causing surges. It shall be adjustable with bronze body and stainless-steel trim. Pressure relief valve shall be Cash-Acme type K-10, with a 5 to 75 psi adjustment range, Bell & Gossett, or approved equal.

2.14 BACKFLOW PREVENTER VALVES

- A. General: Backflow preventers shall work on the reduced pressure principle. They shall consist of two (2) spring-loaded check valves, automatic differential pressure relief valve, drain valves and shut-off valves. The body material shall be bronze or cast iron for a working pressure of not less than 150 psi, with bronze or stainless-steel trim. Drain lines with air gaps shall be provided.
- B. See MD-WASD Pre-Approved Products List for backflow prevention devices.

PART 3 EXECUTION

3.01 GENERAL

- A. All valves shall be installed in accordance with provisions of Section 15100, "Valves, General." Care shall be taken that all valves in are well supported on each end of the valve.
- B. Installation of both manual and automatic air release valves shall be in accordance with the Standard Details.
- C. All valves shall be installed in accordance with the Standard Details and manufacturer's recommendations.
- D. All air and vacuum release valves installed in pump stations shall have piped outlets to the nearest acceptable drain, firmly supported, and installed in such a way as to avoid splashing and wetting of floors.

END OF SECTION

SECTION 330536
HIGH DENSITY POLYETHYLENE PIPE

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope:

1. This section specifies high density polyethylene (HDPE) pipe, fittings, and appurtenances for piping 4 inches to 63 inches in nominal diameter. The designation HDPE is used in the Piping System Specification Sheets (PIPESPEC) in Section 40 05 01 – Piping Systems and in this section.

B. Characteristics:

1. The piping system shall conform with the following:

Dimension ratio (DR)	DR 11
Pressure Class in accordance with AWWA C906	200 psi
Maximum deflection in installed condition, percent of the average inside diameter of the pipe	2.7

1.02 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

References	Title
ANSI/AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings, 4-inch through 63-inch, for Water Distribution
ASTM D2321	Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D2657	Heat Joining Polyolefin Pipe and Fittings
ASTM D3350	Polyethylene Plastics Pipe and Fittings Material
PPI TR 31	Underground Installation of Polyolefin Piping

- B. Inspection and Testing:
 - 1. All HDPE materials, pipe and fittings shall be inspected and tested in accordance with the requirements of AWWA C906.
- C. Affidavit of Compliance:
 - 1. The manufacturer shall furnish an affidavit of compliance conforming to the requirements of AWWA C906, Section 1.5, affirming that the piping components comply with the requirements of AWWA C906 and this section. The affidavit shall be signed under penalty of perjury by an officer of the pipe manufacturer's company.

1.03 SUBMITTALS

- A. The following submittals shall be provided in accordance with Section 01 33 00 - Submittals:
 - 1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole.

If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations.

The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
 - 2. Detail drawings which show the type and location of all fittings, joints, and connections to structures and manholes.

PART 2 PRODUCTS

2.01 GENERAL

- A. HDPE materials, pipe and fittings shall be manufactured, inspected, sampled and tested in accordance with the requirements of AWWA C906 and this section. In case of conflict between the requirements of this section and AWWA C906, the requirements of this section shall prevail.

2.02 MATERIALS

- A. HDPE piping components shall be manufactured from materials that meet or exceed the requirements of the Plastic Piping Institute designation PE3408 and that conform to the requirements of ASTM D3350 for a cell classification of PE 345434C.
- B. Bolts and nuts for buried mechanical joining components such as flanges shall be made of noncorrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21, regardless of any protective coating.

2.03 PIPE

- A. Pipe shall have the nominal dimensions shown with an IPS outside diameter basis and the dimensions and tolerances specified in AWWA C906. DR rating and pressure class shall be as specified in paragraph 1.01 Characteristics.

2.04 FITTINGS

- A. Fittings shall conform to the applicable requirements of AWWA C906 for the joining methods specified in paragraph 3.02 Joining.

2.05 PIPE MARKINGS

- A. Pipe marking shall conform to the requirements of AWWA C906.

2.06 PRODUCT DATA

- A. The following product data shall be provided in accordance with Section 01 33 00 - Submittals:
 - 1. Affidavit of Compliance specified in paragraph 1.02 Affidavit of Compliance.
 - 2. A report containing a copy of all manufacturer's test results for all tests conducted in accordance with paragraph 1.02 Inspection and Testing.

PART 3 EXECUTION

3.01 PIPE HANDLING AND STORAGE

- A. The Contractor shall use care in handling and storage of the pipe. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The handling of the pipe shall be done in such a manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.
- B. Sections of pipe with cuts, gouges, or scratches on the outside diameter (OD) surface that exceed 10-percent of the wall thickness of the pipe shall be removed completely and the ends of the pipeline rejoined. The inside diameter (ID) surface shall be free of cuts, gouges, and/or scratches.

3.02 INSTALLATION

- A. General:
 - 1. Unless otherwise specified, the piping system shall be installed in accordance with ASTM D2321, AWWA C906 and the manufacturer's recommendations.
 - 2. When pipe is used for air conveyance, Contractor shall install drain connections at all low points in the ductwork and at all locations shown on the Drawings. Drain shall be run to nearest convenient drain.
- B. Joining:
 - 1. Pipe and fittings shall be joined into continuous lengths on the job site above ground. Unless otherwise specified, joining shall be by the butt-fusion method performed in

accordance with the pipe manufacturer's recommendations and ASTM D2657. Socket fusion, extrusion welding and hot gas welding shall not be used.

2. The pipe supplier shall be consulted to obtain machinery and expertise for the joining by butt-fusion of HDPE pipe and fittings. No pipe or fittings shall be joined by fusion by any of the Contractor's personnel unless they are adequately trained and qualified in the techniques involved. Butt fusion joining shall yield a joint strength equal to or greater than the tensile strength of the pipe.
3. Flanged joining, or other mechanical joining methods specified, may be used to make connections to differing piping materials, to equipment, valves and other appurtenances, and where specified.

C. Trench Excavation:

1. Trenches shall be excavated to ensure that sides will be stable under all working conditions. Trench walls or supports shall comply with all local and national standards for safety.

D. Location and Alignment:

1. Pipe and fittings shall be placed in the trench with the invert conforming to the elevations, slopes, and alignments shown.

E. Bedding and Backfill:

1. Materials used for bedding and backfill shall be as specified in Section 31 00 00 - Earthwork and as shown.
2. Place materials by methods that will not disturb or damage the pipe. All HDPE pipe shall be at the temperature of the surrounding soil at the time it is backfilled and compacted. Work in and tamp the bedding material in the area under the pipe and up to the spring line before placing and compacting the remainder of the embedment. Blocking under the pipe shall not be permitted.
3. Use compaction equipment and techniques that are compatible with materials specified and location in the trench. Before using heavy compaction or construction equipment directly over the pipe, place sufficient backfill to prevent damage, excessive deflections, or other disturbances of the pipe.

3.03 TESTING

A. General:

1. Testing of piping shall be as specified in Section 40 05 01 – Piping Systems and this section. In case of conflict, the requirements of this section shall prevail.

B. Hydrostatic Pressure Testing:

1. HDPE piping systems shall be fully pressure tested prior to covering the piping and placing the line into service. Water shall be the test medium for hydrostatically testing the pipe. Test procedures shall be as specified in Section 40 05 01 – Piping Systems and the following. In case of conflict, the following procedures shall apply.
2. Cover the pipe at intervals and/or at curves if necessary to hold the pipe in place during testing. Connections shall be left exposed for visual leak inspection.
3. After all free air is removed from the test section; the pressure in the pipe shall be raised at a steady rate to the required pressure. The pressure in the section shall be measured at the lowest point of the test section. Test pressure shall be as specified

in Section 40 05 01 – Piping Systems. The initial pressure shall be applied and allowed to stand without makeup pressure for 2-3 hours to allow for diametric expansion or pipe stretching to stabilize. After the equilibrium period, the test section shall be returned to the required test pressure and held for 3 hours. Amounts of makeup water allowable for expansion during the pressure test shall be as listed in the Plastic Pipe Institute Technical Report TR 31-88. No visual leaks or pressure drops shall be observed during the final test period.

C. Deflection Testing:

1. General: Deflection testing shall be performed on the entire length of installed pipe no sooner than 30 days after completion of work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads. Deflection of pipe and fittings in the installed pipeline under external loads shall not exceed the maximum deflection specified in paragraph 1.01 Characteristics. Either of the following devices and procedures may be used to measure deflection.
2. Pull-Through Deflection Testing: The Contractor shall determine whether the allowable deflection has been exceeded by use of a pull-through device.
 - a. Pull-Through Device: This device shall be a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section. Pull-through device may also be of a design promulgated by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device. Ball, cylinder, or circular sections shall conform to the following:
 - 1) A diameter, or minor diameter as applicable, equal to the average inside diameter of the pipe minus the dimension equivalent of the maximum installed deflection specified in paragraph 1.01 Characteristics. A tolerance of plus 0.5 percent in the diameter of the test device will be permitted.
 - 2) A homogeneous material throughout, with a density greater than 1.0 as related to water at 39.2 degrees F, and a surface Brinell hardness of not less than 150.
 - 3) Center bored and through bolted with a 1/4-inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.
 - 4) Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.
 - b. Pull-Through Device Procedure: Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as specified.
3. Deflection Device: The Contractor shall determine whether the allowable deflection has been exceeded by use of a deflection measuring device.
 - a. Deflection Measuring Device: This device shall be sensitive to 1.0 percent of the diameter of the pipe being tested and accurate to 1.0 percent of the indicated

dimension. The deflection measuring device shall be approved by the Construction Manager prior to use.

- b. Deflection Measuring Device Procedure: Measure deflections through each run of installed pipe. If deflection readings in excess of the maximum allowable specified in paragraph 1.01 Characteristics are obtained, retest pipe by a run from the opposite direction. If retest continues to show a deflection in excess of the allowable, remove pipe which has excessive deflection, replace with new pipe, and completely retest in the same manner and under the same conditions.

END OF SECTION

SECTION UC-250**GRAVITY SEWER SYSTEMS****PART 1 - GENERAL****1.01 SCOPE**

- A. These Specifications shall govern the design, materials and installation requirements of the Department for gravity sanitary sewer systems constructed in its service area when using Poly (Vinyl Chloride)(PVC) pipe and fittings, Vitrified Clay (V.C.) pipe and fittings or Ductile Iron pipe and fittings. "PVC" shall mean Poly (Vinyl Chloride) as it relates to pipe and fittings.
- B. This Specification does not purport to cover all material or installation procedures which may be required, whether by the nature of the proposed work, or by the Department, or by other regulatory agencies.
- C. It is intent of the Department to obtain a complete and working installation under this project, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically shown on the Plans or stated herein.

1.02 QUALITY ASSURANCE

- A. All material and installation shall be in accordance with the Department's Design and Construction Standard Specifications and Details.
- B. The material and installation for this project shall be in full compliance with all applicable standards listed in Section 01090, "Reference Standards"

1.03 DEFINITIONS

See Section 01005, "Defined Terms"

1.04 PROJECT APPROVAL

The approval of the Department shall be secured, in accordance with Section 17005, prior to any construction related activity.

1.05 SPECIAL CONDITIONS

The work shall proceed in accordance with the following specification sections, bound herein:

- A. Section 01011 - Site Conditions
- B. Section 01016 - Safety Requirements and Protection of Property
- C. Section 01031 - Grades, Lines and Levels
- D. Section 01100 - Special Project Procedures
- E. Section 01750 - Maintenance of Traffic and Public Streets

1.06 DESIGN REQUIREMENTS

A. GENERAL

1. Gravity sanitary sewer systems shall be designed in accordance with the State of Florida Department of Environmental Protection (DEP) Rules, Chapter 62-604 for Wastewater Facilities, with OSHA requirements and with the "Florida State Board Health Sewage Guide" and the recommendations of Chapter 12 of the ASCE Manual No. 37, "Sewer Design and Construction", except as otherwise provided herein. Wet wells and manholes shall be classified as hazardous areas, Class 1, Division 2, Group C.
2. In addition, systems shall be designed in accordance with the requirements of the Miami-Dade County Department of Environmental Resource Management (DERM), the requirements of the latest edition of the South Florida Building Code and the Miami-Dade Water and Sewer Department Standards and Specifications.
3. The use of PVC pipe or AWWA C900 PVC pipe within a public water supply wellfield cone of influence or in areas zoned industrial or commercial shall be as stated under "Tightness Standards" in Section UC-370.
4. Manhole to manhole runs shall be kept in the range of no more than 400 feet without permission.
5. Slope shall be such as to maintain two feet per second minimum velocity when running full or half full when calculated using the Manning Equation with a roughness coefficient of .013.
6. Minimum slope for terminal runs shall be 0.40 percent for eight inch pipe. This slope shall be maintained for a minimum of 300 feet and longer if loading is abnormally light.
7. Design shall be performed by experienced personnel who have previously designed sewerage collection systems in Miami-Dade County. Proof of experience shall be provided if required by the Department. All design work submitted for approval shall be signed, sealed and dated by a registered professional engineer licenced to practice in the State of Florida.
8. The Department reserves the right request complete design calculations, which shall be submitted and shall be in a format easily read.
9. Design shall be conservative with sufficient peaking and infiltration factors included. Absolute minimum slopes shall not be used since minor field construction variations will reduce slopes and give actual velocity of less than two feet per second.
10. The Department reserves the absolute right to require greater slopes, higher peaking or infiltration factors if this is considered necessary upon review of design. The design/build firm shall conform with any such requirements and supply said design and construct same at no extra cost to the County.
11. The use of PVC pipe and fittings will only be permitted for gravity sanitary sewers (and service laterals) 15-inches in diameter and smaller.

1.07 PERMITS, INSPECTIONS AND FEES

- A. The Contractor shall obtain and pay for all permits, official inspections and all other fees in accordance with Section 01740, "Permits".
- B. Inspection by Department personnel is required in addition to, not in lieu of, municipal and County department inspections (if any).
- C. No installation will be accepted until it has passed all inspections, including pavement installation or replacement.

1.08 PRECONSTRUCTION CONFERENCE

Prior to commencement of the work, the Contractor shall attend a "Preconstruction Conference" in accordance with Section 01150, "Preconstruction Conference".

1.09 SUBMITTALS

- A. The Contractor shall furnish "As-Built" in accordance with Section 01725. Project Record Documents shall be submitted in accordance with Section 01720. The Contractor shall submit operating and maintenance instructions and all other submittals in accordance with Section 01730.
- B. Where the Specifications require test certification or certification that certain products or material furnished are as specified, the Contractor shall deliver such certification to the Department. No material or equipment shall be approved for use in the work until individual certification has been received.

1.10 SAFETY REQUIREMENTS

- A. The Contractor shall be in compliance with all applicable provisions of the Occupational Safety and Health Act of 1970, in general, and any subsequent amendments and revisions thereto and specifically to the provisions concerning confined space entry.
- B. The Contractor's personnel will be in the vicinity of raw sewage. For his own protection, as well as for his employees, he shall check with Metropolitan Dade County Health Department, and based upon their recommendation, shall have his personnel properly immunized against disease.
- C. Under this project, personnel may be required to enter the existing manholes/sewers to perform certain items of work. Before entering, the Contractor shall be in compliance with Dade County Manhole Ordinance No. 83-3 (which mandates, in part, that above-ground safety personnel shall be on duty at all times when someone enters or works in a manhole/sewer and the air within a manhole / sewer shall be tested with a combination oxygen deficiency meter-explosion meter to determine oxygen content and explosion potential). A test for the presence of hydrogen sulfide shall also be performed. The work area must be ventilated mechanically by the use of an air blower, before entry and during occupancy, to insure that an adequate quantity of oxygen is supplied to the work area.

- D. The Contractor shall conduct his operations in such a manner, utilizing warning devices such as traffic cones, barricades and warning lights, and personnel such as flagmen and uniformed police officers, that the public is given adequate warning of hazards of the work site as may be deemed necessary by the authority having jurisdiction and/or the Department. See Section 01750, "Maintenance of Traffic and Public Streets."
- E. In the instance of men working within the manholes, the Contractor shall provide safety provisions to cover any possible consequences of structural failure and/or flooding. Such provisions might take the form of, but not be limited to, ladders in position to permit rapid egress; safety harnesses ; stand-by pumping equipment; extra air supplies; and such other measures as the situation and good construction practices might indicate.
- F. Certain products specified in these Specifications contain warnings by the manufacturers that under certain conditions, if instructions for use of the product are not followed, a hazardous condition may exist. It is the Contractor's responsibility to instruct his workmen in the safe use of the product, or any product substitution.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All material for use in the Project shall be new and of recent domestic manufacture and shall be the products of reliable manufacturers or suppliers who, unless otherwise specified, have been regularly engaged in the manufacture of such materials and equipment for at least five (5) years.
- B. All fittings and components shall, wherever possible, be standard stock articles of well known manufacturers.
- C. Where the Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use, but, unless otherwise provided, articles or products of similar characteristics may be offered for the approval of the Department, upon approval by the Engineer of Record.
- D. Copies of complete descriptive data shall be furnished regarding all material, consisting of dimension drawings, catalog references and other information necessary to clearly identify each article.
- E. When substitutions are permitted, the Contractor shall make all necessary changes in adjacent or connected structures and equipment, at his expense
- F. Unless otherwise specified, all steel bolts, nuts, washers and all other miscellaneous ferrous metal items (except cast iron) furnished by the Contractor shall be hot-dip galvanized in accordance with ASTM A386, "Zinc Coating (Hot-Dip) on Assembled Steel Products" and ASTM A385, Providing High-Quality Zinc Coatings (Hot-Dip)". Where the word "galvanized" or its abbreviation is used on the Plans or in the Specifications, it shall mean hot-dip galvanized. Fabricated items shall be hot-dip galvanized after fabrication. Internal threads shall be tapped or re-tapped after galvanizing.

- G. Where miscellaneous materials are required for a complete installation the Contractor shall provide such materials in conformance with Section 15065, "Miscellaneous Material".
- H. See Section 01100 for water used in construction.

2.02 CASTINGS

A. GENERAL

1. Material used in the manufacture of the castings shall conform to ASTM A48, "Gray Iron Castings", for Class 30 iron. Manhole and valve box covers shall have a roadway or pedestrian type surface as required by location, and shall be non-rocking.
2. Castings shall be in compliance with Section 05550. Castings shall be as manufactured by U.S.F. Fabrication, Inc., Neenah Foundry, or approved equal.
3. Castings shall be delivered unpainted with a shotblasted finish.

B. MANHOLE FRAMES AND COVERS

Manhole covers and frames shall be Department Type "A" U.S.F.&F No. 310 as manufactured by U.S.F. Fabricating, Inc., Hialeah, Florida, or approved equal. The covers shall be cast labeled "SANITARY SEWER".

2.03 BRICK

- A. Clay Brick: Bricks for manhole construction shall be dense, hard burned, common clay brick conforming to ASTM Standard C62, "Building Brick (Solid Masonry Units made from Clay or Shale)".
- B. Concrete Brick: Concrete bricks shall conform to ASTM Standard C55, "Concrete Building Brick".
- C. All bricks shall have true edges and sharp corners and shall have been cured for at least 14 days before being placed.

2.04 CONCRETE, MORTAR AND GROUT

See Section 17033, "Concrete, Mortar and Grout (Short)"

2.05 EMBEDMENT MATERIAL

Embedment material, for bedding, haunching and initial backfill, shall conform with the requirements of Section UC-300 "Gravity Sewer Pipe Foundation".

2.06 MANHOLE

- A. Shallow manholes shall be constructed of brick or precast concrete. All other manholes shall be constructed of precast concrete. See Section 02536, "Precast Manholes & Covers"

- B. Castings for manhole frames, covers and other items shall conform to Subsection 2.02, above. Casting patterns shall conform to those designated in the Miami-Dade Water and Sewer Standard Details.
- C. Concrete shall conform to Section 17033.
- D. Brick for manhole construction shall be clay brick, in accordance with Subsection 2.03, above.
- E. Cement mortar for manhole construction shall conform to Section 17033. It shall be mixed dry and then wetted to proper consistency for use. No mortars that have stood for more than one hour shall be used. Brick manholes shall be coated with 3/4-inch thickness of mortar both inside and outside.
- F. The invert channels shall be formed of brick or brick rubble thoroughly bedded and covered with sand-cement grout, accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section. Steep slopes outside the invert channels shall be avoided. Changes in size and grade shall be made gradually and evenly. Changes in the direction of the sewer or entering branch shall be a smooth curve with radius as long as practical.
- G. Frames and covers shall be set accurately to grade with a minimum of 3 and a maximum of 5 courses of brick provided as a leveling course. It shall be the Contractor's responsibility to assure that the frames and covers are set to match existing and/or proposed finish paving grades at the manhole locations.
- H. For PVC Sewers:
 - 1. The first joint at both influent and effluent sewers at each manhole, including service laterals, shall consist of an approved manhole coupling grouted into the manhole wall, and providing a continuous watertight elastomeric gasket seal between the coupling and the pipe inserted therein. The coupling shall have an increasing tapered interior from the gasket groove to allow flexibility for the pipe in the event of future settlement of the manhole or pipeline.
 - 2. The first length of PVC pipe into or out of the manhole shall be 2-feet long, maximum, and shall be either plain-end by plain-end, or plain-end by bell. In the first option, the next joint shall be a double bell PVC repair coupling (no stop) with a maximum 1-inch gap between the pipes inserted therein. In the latter option, the next joint shall be another 2-foot long section, maximum, of plain-end by bell PVC pipe.
- I. For Ductile Iron and Vitrified Clay Sewers

The first length of pipe into or out of the manhole shall be a 2-foot length of plain end by plain end ductile iron pipe (i.e. 2' as measured from the outside wall) grouted directly into the opening in the manhole wall. This P.E. X P.E. short shall be joined to the spigot end of an adjacent ductile iron sewer main by use of a ductile iron solid sleeve. In the instance of a vitrified clay main, the ductile iron P.E. X P.E. short manhole stub out shall be joined to the V.C. spigot by use of a double hub connector for vitrified clay pipe. Note that C-900 PVC repair couplings shall not be used in ductile iron or vitrified clay mains.

- J. Where shown on the drawings, the Contractor shall provide stub-outs for future extensions. Both ends of all such stubouts shall be closed with specified PVC plugs.
- K. Precast manholes shall conform to Section 02536, "Precast Manholes & Covers". In precast concrete manholes, holes for sewer line connections, with a diameter equal to the outside diameter of the connecting sewer plus an additional four inches (4"), shall be formed in the manhole walls. No cutting or chipping at pre-formed holes, or cutting additional holes in precast concrete walls will be allowed.
- L. A minimum of three to a maximum of five courses of brick shall be constructed atop each manhole corbel.
- M. Prior to acceptance of manhole, the Contractor shall verify that he has installed required manhole accessories and coating/lining (See Section 02536)

2.07 POLY (VINYL CHLORIDE) PIPE

Pipe for use in gravity sewer systems shall be Vitrified Clay, Ductile Iron with polyethylene or ceramic epoxy (Protecto 401) lined, PVC SDR 35, or AWWA C900, C905 PVC as shown on the plans or called out elsewhere herein. For further information on these types of pipe, see Section 15060, "Piping and Fittings".

2.08 REINFORCING STEEL

- A. Bar reinforcement for concrete structures shall conform to the requirements of ASTM Standard A615 "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement", Grade 60, Deformed, except that steel manufactured by the Bessemer Process will not be accepted. Wire mesh reinforcing for concrete paving or driveway repairs, if required, shall be welded wire fabric meeting the requirements of ASTM Standard A185, "Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement".
- B. The Contractor shall furnish the Department with manufacturer's test certificates showing the steel to meet the above requirements, in addition to which the Department may take representative samples from the material on the job and have them tested by an independent testing laboratory. Completely detailed shop drawings and bending schedules shall be submitted by the Contractor for the approval of the Engineer of Record. Such approval shall be obtained before the bars are cut and bent.

2.09 DUCTILE IRON CASING PIPE

Ductile iron casing pipe shall be ANSI/AWWA Standard C151/A21.51, Class 50, no lining required. Casing pipe shall be one size larger than PVC pipe to be encased, unless otherwise approved.

2.10 DUCTILE IRON SEWER PIPE

- A. Ductile iron sewer pipe shall be ANSI/AWWA Standard C151/A21.51, Class 53 for 6-inch, Class

52 for 8-inch, Class 50 for 10-inch through 15-inch. Ductile iron pipe shall conform to Section 15060.

- B. All ductile iron pipe and fittings 8-inches and larger in diameter for use in force mains and gravity sewers, except riser pipes, shall be delivered with either heat fused virgin polyethylene lining or ceramic epoxy lining (See Section 15060). The only ceramic epoxy material approved by the Department at this time is a high-build multi-component Amine cured Novalac epoxy, Protecto 401, by Vulcan Painters, Inc. of Bessemer, AL 35021.

2.11 MISCELLANEOUS MATERIAL

- A. The Contractor shall furnish and install all miscellaneous material and appurtenances required for a complete installation. Section 15065 specifies material necessary for a complete installation, not specified herein. These material, including the following, shall be installed when required, whether shown on the Plans or not.
 - 1. Paint, Bituminous
 - 2. Caulking Compound
 - 3. Manhole Couplings
 - 4. PVC double bell repair couplings, No-stop (sleeves)
 - 5. PVC double bell transition couplings or adapters PSM SDR-35 PVC Sewer Pipe to ductile-iron or AWWA C900 CI-PVC Pressure pipe.
 - 6. Stainless steel repair clamps, with stainless steel bolts

PART 3 - EXECUTION

3.01 PIPE INSTALLATION, GENERAL

- A. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and, in general, conform with manufacturer's recommendations. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the Contractor at his expense.
- B. Pipe and fittings shall, at all times, be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the Department. Such materials shall be so placed as to keep obstruction to traffic minimum.
- C. Upon satisfactory completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support with no pressure being exerted on the pipe joints from the trench bottom.
- D. Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of

the pipes shall be thoroughly cleaned of all foreign matter and other deleterious materials by methods acceptable to the Department. During suspension of work, for any reason, at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud, dirt, groundwater or other foreign material from entering the pipe. Any pipe which is disturbed or found defective shall be immediately removed and replaced with sound pipe.

- E. Gaskets shall be thoroughly checked for breaks, cuts or other damage, and shall be free of oil, grease, dirt or other foreign matter. Pipe joints shall be assembled with care. Lubricant, if required shall be as recommended by the manufacturer of the pipe, and shall have no deteriorating effects on the gasket and pipe materials. If assembly is under water, lubricant recommended by the manufacturer for underwater use is required.
- F. Good alignment of the pipe is required for assembly. Align the spigot to the bell of the previously laid pipe and insert the spigot into the bell until it uniformly contacts the gasket. Apply steady pressure until the spigot easily slips through the gasket. Do not push or swing the spigot into the bell. Smaller diameter pipe and fitting may be assembled manually. Mechanical means such as bars and blocks, ratchets or jacks shall be used for joining larger pipe and fittings. Power equipment such as a backhoe bucket, shall not be used to assemble pipe and fittings, since excessive force may damage the gasket or bell.
- G. Cutting the pipe in the field shall be done by the Contractor in a neat and workmanlike manner using manual or power saws. The pipe shall be marked around its entire circumference before cutting to assure a square cut. After cutting, the end shall be beveled with a beveling tool, rasp, or other approved equipment, to the proper taper. Mark the proper insertion depth on the cut and beveled end before installing the cut pipe into the pipeline. Pipe laying shall proceed up-grade from the lowest point of the proposed system, with spigot ends pointing in the direction of flow.
- H. All pipe shall be laid straight, true to the lines and grades shown on the Plans, or matching existing grade, in each section between manholes. The pipe shall be laid so that the identification markings are located on the top of the installed pipelines.
- I. Each individual length of pipe shall be solidly and evenly bedded and haunched throughout its length on a prepared bed on the floor of the trench and not supported in position on blocks or wedges. Pipe shall only be laid when the two preceding lengths have been thoroughly embedded in place to prevent any movement or disturbance of the finished joint. Any pipe which is disturbed or found to be defective after laying shall be taken up and relaid or replaced.
- J. Any work within the pipe and fittings shall be performed with care to prevent damage to the interior wall of the pipe. Damaged interior walls shall be repaired or the pipe section or fitting replaced as required by the Department. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe or fitting.
- K. After pipe has been laid, reviewed and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the conduction of the required tests.

3.02 INSTALLATION OF DUCTILE IRON AND VITRIFIED CLAY PIPE

- A. Installation of gravity sewers shall conform to the applicable requirements of ANSI/AWWA Standard C600-93, "Installation of Ductile Iron Water Mains and Appurtenances".
- B. Cutting of ductile iron pipe for fittings and other connections shall be done by the Contractor in a neat and workmanlike manner without damage to the pipe, the lining, or the coating. Pipe shall be cut with a mechanical pipe saw. After cutting the pipe, the plain ends shall be filed to remove all sharp edges and burrs.

- C. Polyethylene encasement of valves, cast iron pipe and fittings, if required by the Department, shall be installed in accordance with ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A, B or C.
- D. If any difficulty is experienced in assembling lengths of pipe together in the trench, the pipe sections shall be tried on the surface of the ground and each length of pipe plainly marked for position and sequence in which they are to be installed.
- E. Ductile iron solid sleeves shall be used to connect D.I. pipe spigots to existing D.I. manhole stub spigots. Vitrified clay double hub connectors shall be used to connect D.I. manhole stub outs to V.C. pipe spigots.
- F. All bolts, nuts, gaskets or other joint materials for use in the pipeline shall be properly protected.
- G. Gaskets shall be properly stored, and care shall be exercised to keep them away from heat, light, oil, gasoline or other petroleum products. Gaskets shall be kept clean at all times and not handled with greasy or dirty hands.

3.03 INSTALLATION OF POLY VINYL CHLORIDE (PVC) PIPE

- A. Each length of pipe, immediately prior to being placed in position in the trench, shall be inspected, cleaned and prepared for installation. Gaskets shall be thoroughly checked for breaks, cuts or other damage, and shall be free of oil, grease, dirt or other foreign matter. Pipe joints shall be assembled with care. Lubricant, if required, shall be as recommended by the manufacturer of the pipe, and shall have no deteriorating effects on the gasket and pipe materials. If assembly is underwater, lubricant recommended by the manufacturer for underwater use is required. Good alignment of the pipe is required for assembly. Align the spigot to the bell of the previously laid pipe and insert the spigot into the bell until it uniformly contacts the gasket. Apply steady pressure until the spigot easily slips through the gasket. Do not push or swing the spigot into the bell. Small diameter pipe and fittings may be assembled manually. mechanical means such as bars and blocks, ratchets or jacks shall be used for joining larger pipe and fittings. Power equipment, such as backhoe bucket, shall be not be used to assemble pipe and fittings, since excessive force may damage the gasket or bell.
- B. Cutting the pipe in the field shall be done by the Contractor in a neat and workmanlike manner using manual or power saws. The pipe shall be marked around its entire circumference before cutting to assure a square cut. After cutting, the end shall be beveling tool, rasp, or other approved equipment, to the proper taper. Mark the proper insertion depth on the cut and beveled end before installing the cut pipe into the pipeline. Pipe laying shall proceed up-grade from the lowest point of the proposed system, with spigot ends pointing in the direction of flow. All pipe shall be laid straight, true to the lines and matching existing grade, in each section between manholes. The pipe shall be laid so that the identification markings are located on the top of the installed pipelines. At all times when work is not in progress, the exposed ends of all pipes shall be fully protected by an approved stopper to prevent groundwater, dirt, rocks or other substances from entering the pipe.

3.04 PIPE-TO-PIPE CONNECTIONS

Pipe-to-pipe connections shall be made by using solid sleeves for Ductile Iron, double hub

connectors for vitrified clay and double bell couplings for PVC.

3.05 PIPE-TO-PIPE MANHOLE CONNECTIONS

When a sound pipe stub-out exists at a manhole to which connection is to be made, a pipe-to-pipe connection shall be made as described above. If a stub-out is not present or is faulty, an opening shall be cut in the manhole wall and the connection made. The connection shall be constructed as specified above in paragraphs 2.06 H and I with the pipe material/method chosen to match that of the new line. The invert/shelf area inside the manhole shall be cut and reshaped as necessary to construct the new channels in compliance with WASD Standard Details

3.06 GRAVITY SEWER SERVICE LATERALS

See Section UC-310, "Gravity Sewer Service Laterals".

3.07 MODIFICATIONS OF EXISTING MANHOLES

See Section UC-330, "Repairs to Department Sewers"

3.08 EXCAVATION

See Section 02315, "Trenching and Backfilling for Piping Systems"

3.09 SEWER PIPE FOUNDATION

See Section UC-300, "Gravity Sewer Pipe Foundation"

3.10 CLEANING AND TESTING

See Section UC-370, "Cleaning and Testing Gravity Sewers"

3.11 SEWERAGE REMOVAL

See Section UC-290, "Removal of Sanitary Sewerage and Debris"

3.12 SEWAGE FLOW CONTROL

See Section UC-320, "Sewerage Bypass Pumping and Flow Control"

3.13 REPAIR OF DAMAGE TO DEPARTMENT MAINS & SEALING LEAKS

See Section UC-330, "Repairs to Department Sewers"

3.14 DEFLECTION TEST

See Section UC-350, "Sewer Deflection Test"

END OF SECTION

SECTION UC-310**GRAVITY SEWER SERVICE LATERALS****PART 1 - GENERAL****1.01 SCOPE**

The Contractor shall furnish all labor, material, equipment and appurtenances necessary for the installation of gravity sewer service laterals, complete, in accordance with these specifications.

1.02 RELATED SECTIONS

Section 01016 - Safety Requirements and Protection of Property
Section 02315 - Trenching and Backfilling for Piping Systems
Section UC-250 - Gravity Sewer Systems

1.03 QUALITY ASSURANCE

- A. Lateral sewers shall be installed in accordance with all the applicable requirements for pipe installation. Branch fittings shall be installed in the main line sewer as it is constructed, in the locations and configuration of the original laterals or as designated by the Engineer.
- B. All excavations shall be executed in accordance with the South Florida Building Codes, OSHA requirements, the State of Florida Trench Safety Act (TSA), the State of Florida Trench Safety Act (TSA) and all applicable requirements of Section 01016, including notification of the Sunshine State One-Call Center (1-800-432-4770), 48 hours prior to any excavation.

PART 2 - PRODUCTS

See Part 2 of Section UC-250, "Gravity Sewer Systems" & "Tightness Standards" under Section UC-370.

PART 3 - EXECUTION**3.01 INSTALLATION OF LATERALS**

- A. Service laterals shall be installed in accordance with the requirements for gravity main installation. Branch fittings shall be installed in the main line sewer as it is constructed. The branch fittings shall be either a tee set for a modified riser when the top of the sewer is 7 feet or deeper, or a wye set and connected as shown in the Miami-Dade Water and Sewer Department's Standard Details SS 1.0 and 2.0, respectively. In no case shall the branch be covered until its location has been measured and recorded.
- B. Where a service lateral enters a manhole at an elevation of 2 feet or more above the

sewer main invert, a drop connection shall be required.

- C. Each service lateral shall be plugged at the point shown on the Standard Details. Plug shall provide a watertight seal, without the use of adhesives or epoxies, and shall be subject to approval by the Department. In no case shall a service lateral be covered until its exact location is measured and recorded, nor until a two-inch square by two feet long, pressure-treated pine stake, with the top stained or painted green, has been set by the Contractor at the end of the service lateral.
- D. The Contractor shall not excavate trenches for service laterals to both sides of the street at the same time unless written permission has been secured in advance to close the street.

3.02 REMOVAL AND REPLACEMENT OF LATERALS

- A. Excavate in accordance with Section 02315, "Trenching and Backfilling for Piping Systems"
- B. The existing laterals shall be hand excavated to a joint, disassembled, or if necessary saw cut, clean and square and the appropriate adapter installed to connect the replacement lateral. Care shall be taken to maintain the slopes of the existing lateral. The lateral shall be removed and replaced from the main line to a point along the existing lateral determined by the Engineer of Record to be in acceptable condition.
- C. Placement of bedding/cover materials in the trench shall be the same for laterals as provided in Section UC-300, "Gravity Sewers Pipe Foundation".

END OF SECTION

GEOTECHNICAL ENGINEERING REPORT

**GEOTECHNICAL ENGINEERING
REPORT**

For:

**MDC RICKENBACKER CAUSEWAY
COMFORT STATION NO. 2
MIAMI-DADE COUNTY, FLORIDA**

Prepared for:

**BND ENGINEERS, INC.
2100 PONCE DE LEON BLVD
SUITE 1270
KEY BISCAYNE, FL 33134**

Prepared by:

**PROFESSIONAL SERVICE
INDUSTRIES, INC.
7950 N.W. 64TH STREET
MIAMI, FLORIDA, 33166**

PSI PROJECT No. 0397-1674

July 25, 2022





7950 NW 64th Street.
Miami, FL 33166
phone: 305.471.7725
fax: 305.593.1915
intertek.com/building
psiusa.com

July 26, 2022

BND Engineers, Inc.

2100 Ponce de Leon Blvd, Suite 1270
Key Biscayne, FL 33134

To: Mr. Kevin Keane, PE – Sr. Vice-President

Re: Geotechnical Engineering Report
MDC Rickenbacker Causeway Comfort Station No. 2
Rickenbacker Causeway
Key Biscayne, Miami Dade County, Florida

Dear Mr. Keane:

Professional Service Industries, Inc. (PSI), an Intertek Company, has completed the geotechnical engineering evaluation in connection with the referenced project in Key Biscayne, Florida. Our initial services were provided in general accordance with the subconsultant agreement between BND and PSI signed by Mr. Kevin Keane and dated May 18, 2022. The geotechnical engineering report presents the results of the subsurface exploration and our geotechnical recommendations for the proposed MDC Rickenbacker Causeway Comfort Station No 2 located in Miami-Dade County, Florida.

We trust this report is suitable for your current needs; however, should you have any questions, or should additional information be required, please do not hesitate to contact our office at (305) 471-7725.

Respectfully Submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Certificate of Authorization No. 3684

A handwritten signature in blue ink, appearing to read "Lucrèce E. Régisme".

Lucrèce E. Régisme
Staff Engineer – Geotechnical Services
lucrece.regisme@intertek.com

Jose N. Gómez, P.E., D.GE
Chief Engineer-Geotechnical Services
P.E. 78289
jose.n.gomez@intertek.com

Cc: Addressee (1-PDF)
LER/JNG/ler

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APPENDIX A

Figure 1:	Site Vicinity Map
Figures 2:	Boring Location Plan

APPENDIX B

Boring Log Key
Boring Logs (B-1 to B-5)
Summary of Boring Locations

APPENDIX C

Summary of Laboratory Test Results

1.0 PROJECT INFORMATION

1.1 GENERAL

The scope of services for this project included the completion of a subsurface evaluation, laboratory testing program and geotechnical engineering recommendations for design and the MDC Rickenbacker Causeway Comfort Station No. 2 in Key Biscayne, Florida. The purpose of this evaluation was to obtain the necessary engineering properties of the in-situ soils and provide design (soil parameters, lateral earth pressure, allowable bearing capacity, etc.) and construction recommendations (fill materials and compaction requirements, trench excavations, dewatering, etc.) for the proposed pipeline and pump station construction.

1.2 SITE DESCRIPTION

Generally, the project areas consist of asphalt concrete paved roadway. The site appears to be generally flat. A site vicinity map identifying the project location with respect to existing streets and features is presented in **Figure 1 of Appendix A**.

1.3 PROPOSED CONSTRUCTION

Based on the information provided, we understand that the proposed project consists of the design and installation of a new small pump station and 1,300 linear feet of eight-inch HDD force main running across Rickenbacker Causeway using horizontal directional drilling in Key Biscayne, Florida.

If any of the noted information is incorrect or has changed since we started evaluating this project, please notify PSI so that we may amend the recommendations presented in this report, if appropriate, within the required project time frame.

2.0 FIELD EXPLORATION AND SUBSURFACE CONDITIONS

2.1 STANDARD PENETRATION TEST (SPT) BORINGS

To evaluate the subsurface conditions along the proposed pipeline alignments, we drilled and sampled a total of five Standard Penetration Test (SPT) soil borings to depths of 20 to 35 feet below grade at the time of our field exploration (B-1 through B-5). The approximate locations at which the SPT borings were drilled are shown in **Figure 2 of Appendix A** and listed in **Table 1 of Appendix A** (note that actual boring ground elevations were not provided).

After seating the sample spoon six inches into the soils, the number of successive blows required to drive the sampler twelve inches into the soil constitutes the test result commonly referred to as the "N" value. The "N" value has been empirically correlated with various soil properties and is considered to be indicative of the relative density of coarse-granular soils and in less extend the consistency of plastic-fine materials. The SPT borings were performed using a CME-55 truck mounted drill rig, which is equipped with an automatic hammer. The recovered split spoon samples were visually classified in the field and transported to the laboratory for further review. Following completion of our field services, the boreholes were grout sealed, and the site generally cleaned. The proposed boring locations were accessible with our truck-mounted drill rig.

2.2 SITE GEOLOGY

South Florida region is located on the southern flank of Florida Plateau, a stable, carbonate platform on which thick deposits of limestones, dolomites, and evaporates have accumulated; these deposits and associated geological formations were deposited during the Pleistocene epoch (2.3M to 11,700 years ago). The general geology of the upper 200 feet of this platform within the area of South Florida where the proposed project is to be located is composed predominantly of limestone and quartz sand. The geological formations that usually are encountered from top to bottom within Miami-Dade County are the Pamlico Formation (sands and organic silt and peat), Miami Formation within the upper 20 to 50 feet (oolitic limestone) and Fort Thompson Formation within depths intervals of 50 to 500 feet (intercalations of sand with limestone and cemented sand with limestone and cemented sand and shell). See figure below for an illustration of the South Florida geology.

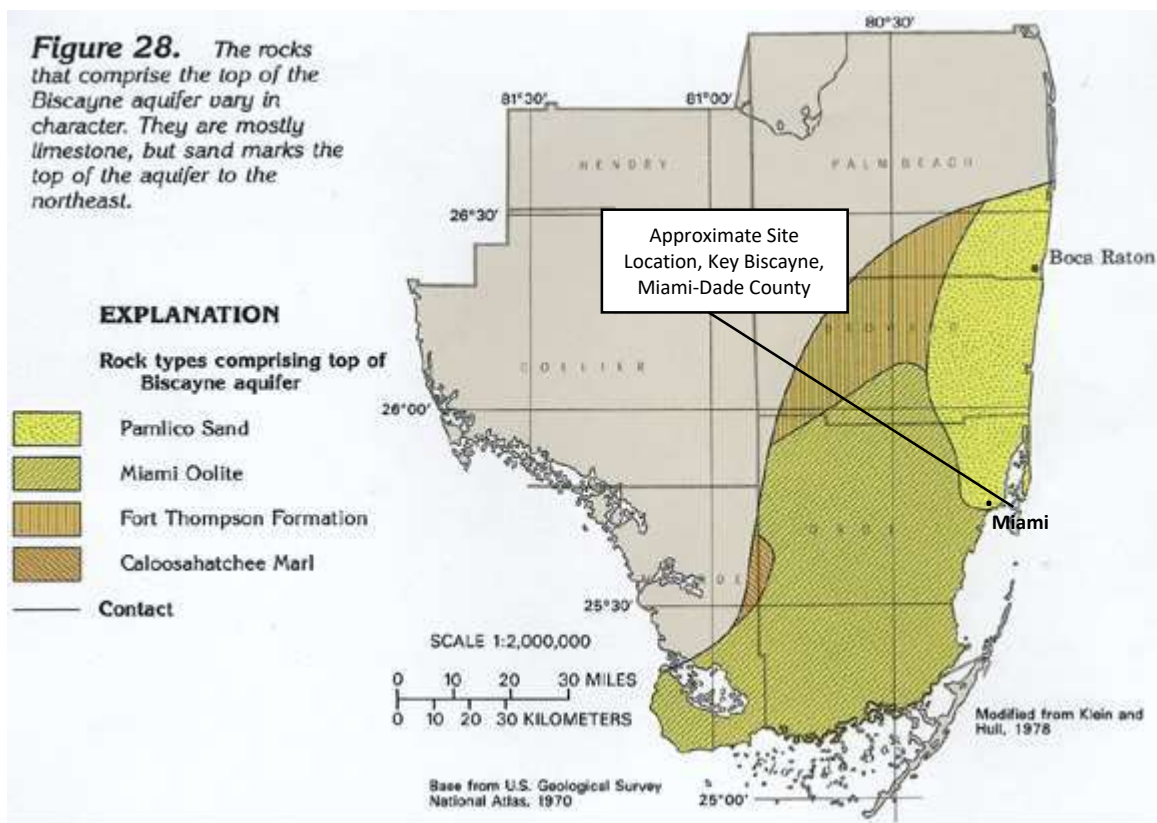


Figure 2.2.1: South Florida Geology

2.3 SUBSURFACE CONDITIONS

Our interpretation of the subsurface conditions is based on the results of five SPT soil borings drilled at the approximate locations shown on **Figure 2**, in **Appendix A**. The following **Table A** summarize the encountered subsurface conditions along the proposed pipeline alignment. For more specific information such as layer depths, please refer to the boring logs and boring summary (generalized soil profile) included in **Appendix B**.

Table A: Generalized Subsurface Conditions Within Project Area

Layer No.	Material Description (USCS)	Approx. Depth Interval (ft.)	Nauto Value Range (bpf)	Nauto Value Average (bpf)	Density
1	Light Brown LIMEROCK with Fine to Medium Sand	0.0 – 3.0	27 - 45	35	Medium Dense to Dense
2a/2b/2b/2d	Heterogeneous layer of Sand with Silt (SP-SM)/Sand (SP)/Silty SAND (SM)/Sandy Silt (ML) with limestone and shell fragments	3.0 – 17.5	32 - WOH	10	Dense to Very Loose
3	¹ Light Brown Weathered Oolitic LIMESTONE (Miami Formation)	17.5 – 35.0	8 - 22	15	Loose to Medium Dense

Notes Table A:

¹ The contractor should anticipate a high resistance to excavation activities as natural limestone (layer 2) was encountered at relatively shallow depths. The limestone formation may require the use of special equipment and breaking tools during construction excavation work and earthwork activities.

It should be noted that the stratification lines shown on the boring logs and boring summary included in **Appendix B** indicate approximate transitions between soil types based on visual observations of the recovered soil samples and the interpretation of the field logs by a geotechnical engineer. In situ stratification changes could occur gradually or at different depths and laterally. Included with the logs are the N-values and groundwater levels measured at the time the borings were drilled. Please note that all SPT soil boring depths discussed below refer to depths below existing site grades at the time of our field exploration.

The recovered soil/weathered rock samples did not show any anomalies such as obvious signs of discoloration or odors. However, we wish to mention that not finding these anomalies in our borings does not guarantee that such materials are present elsewhere along the proposed force main pipeline alignments.

2.4 GROUNDWATER CONDITIONS

The groundwater table was observed in all SPT soil borings at depths ranging from approximately 2.0 to 4.4 feet below existing grades at the time of drilling conducted in June 2022. The variation in the groundwater depths might be due to the difference in ground surface elevation among the boring locations; these elevations were not surveyed. also, it should be noted that groundwater levels fluctuate seasonally in response to high/low tide, rainfall and the infiltration rate of the soil. Therefore, at a time of year different from the time of drilling, there is a possibility of a change in the recorded levels. The rainy season in South Florida is normally between May and October, with September having the most rainfall. We estimate that during the peak of the wet hydroperiod with rainfall and recharge at a maximum, groundwater levels at the site could be at approximately two feet higher than the measured levels during drilling activities.

We recommend that the contractor determine the actual groundwater levels at the time of construction to assess groundwater impact on the construction procedure. Please refer to the individual boring logs presented in **Table 1** of **Appendix B** for details on the groundwater conditions observed at the specific boring locations.

2.5 GEOTECHNICAL ENGINEERING PARAMETERS

The following soil descriptions and geotechnical parameters included in **Table B** were obtained based on empirical correlations between the N-value and the soil/granular weathered rock strength:

Table B: General Geotechnical Engineering Parameters Within Project Area

¹ Layer No.	General Material Description (USCS) [Depth Interval]	Unit Weight, γ (pcf)		² Soil Friction Angle, ϕ (°)	Lateral Earth Pressure Coefficients			³ Steel Wall Friction Angle, δ (°)
		Moist	Saturated (buoyant)		K_a	K_p	K_o	
1	LIMEROCK [0.0' – 2.0']	125	-	36	0.26	3.85	0.41	17
1/2a/2c	LIMEROCK/Sand with Silt/Silty SAND with limestone and shell fragments [2.0' – 4.0']	113	50.6	34	0.28	3.53	0.44	17
2a/2c	Sand with Silt/Silty SAND with limestone and shell fragments [4.0' – 6.0']	101	38.6	32	0.31	3.25	0.47	17
2a/2b/2c	Sand with Silt/Sand with Silt/Silty SAND with limestone and shell fragments [6.0' – 12.5']	96	33.6	30	0.33	3.00	0.50	17
2c/2d	Silty SAND/Sandy Silt with limestone and shell fragments [12.5' – 17.5']	93	30.6	28	0.36	2.77	0.53	17
3	Weathered LIMESTONE [17.5' – 22.5']	107	44.6	32	0.31	3.25	0.47	17
3	Weathered LIMESTONE [22.5' – 32.5']	98	35.6	30	0.33	3.00	0.50	17
2	Weathered LIMESTONE [35.5' – 35.0']	103	40.6	32	0.31	3.25	0.47	17

Notes Table B:

¹ Refer to **Table A** for approximate layer depth intervals.

² The friction angle (ϕ) is based on empirical correlations in the FDOT Soils and Foundation Handbook (SFH):
For Sand $\phi = (N_{\text{auto}}/4) + 28$. For limerock and limestone $\phi = (N_{\text{auto}}/4) + 33$. $N = 1.24 * N_{\text{auto}}$ in accordance with FDOT SFH.

³ The steel wall friction angle was obtained from **Table 1** of NAVFAC DM 7.2-63. For sheet pile wall analysis and design, we recommend modeling layer 2 (limestone) as cohesionless soil (cohesion=0).

3.0 LABORATORY TESTING

The soil samples recovered from the borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classifications. The samples were classified using the Unified Soil Classification Systems (USCS) in general accordance with the American Society of Testing and Materials (ASTM) test designation D2487. The soil classification was based on visual observations and laboratory testing. Our laboratory program consisted of performing material finer than No. 200 sieve (ASTM D1140), moisture content tests (ASTM D2216), and organic content tests (ASTM D2974). Please refer to **Table 2** of **Appendix C** for details on the laboratory testing results.

4.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

4.1 GEOTECHNICAL EVALUATION

Based on the results of our field exploration program, we anticipate the pipelines bearing materials to consist of granular soils or the natural limestone formation.

4.2 PUMP STATION RECOMMENDATIONS

We understand that the proposed pump station will be built to a depth of approximately 30 feet below existing grades. Since the GWT was encountered at approximately 2.0 to 4.4 feet below existing ground, required excavations for the pump station will be partially underwater; construction provisions must be addressed to control the GWT during excavations/construction, and proper shoring system to ensure well stability, as recommended below in **Sections 5.3** and **5.4**.

The soil conditions within the area generally consist of approximately three feet of medium dense to dense limerock fill underlain by a medium dense to very loose heterogeneous layer of sand with silt, silty sand, sand, sandy silt with limestone and shell fragments to 17.5 feet below existing grades, and finally medium dense to loose weathered limestone (Miami Formation) to boring termination depths of 20 to 25 feet below existing grades.

Provided that our recommendations above and in **Section 5.0** are followed, we recommend an allowable bearing capacity of 2,500 psf for the project's structures. The structures are anticipated to undergo less than one inch of total settlement and less than half an inch for differential settlement, since foundation will be partially to totally compensated due to required excavations.

4.3 EQUIPMENT CONCRETE SLAB ON GRADE RECOMMENDATIONS

We recommend that the procedures described in **Section 5.0** of this report be used to prepare the proposed concrete slab subgrade. The proposed concrete slab can bear directly on top of compacted structural fill material; see **Section 5.2** for structural fill and compaction requirements. A modulus of subgrade reaction (k) value of 150 pounds per cubic inch (pci) (based on expected results of a one-foot square plate load test) may be used for design assuring that subgrade was properly compacted. The value of (k) should be geometrically modified and reduced for larger areas.

The concrete slab should be adequately reinforced to reduce the risk of cracking due to any unexpected differential settlement. An impervious vapor retarder should be installed between the soil subgrade and bottom of floor slabs to avoid slab moisture problems. An ultimate friction factor of 0.21 should be used for

the vapor retarder-soil interface with an appropriate factor of safety. The concrete slab design should conform to American Concrete Institute (ACI) design standards and practices

4.4 PIPE TRENCH GEOTECHNICAL RECOMMENDATIONS

The pipes can be designed using a maximum net allowable bearing pressure of 2,500 pounds per square foot (psf) bearing on compacted bedding material or the natural limestone formation. The bedding material shall consist of limerock with a two-inch maximum size or washed and graded limerock (3/8" – 7/8"), six-inch lifts, compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557) or AASHTO T-180.

Materials up to 12 inches above the crown of the pipe shall consist of select backfill material consisting of limerock with a two-inch maximum size, six-inch lifts, compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557) or AASHTO T-180. Materials above 12 inches from the top of the crown of the pipe shall consist of suitable backfill material consisting of limerock with a three-inch maximum size, 12-inch lifts, compacted to at least 98 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557) or AASHTO T-180.

The lateral bearing capacity to resist pipe thrust can be taken as 2,500 pounds per square foot (psf) bearing on compacted backfill material or the natural limestone formation.

If the natural limestone formation is found at the pipe bearing level, in lieu of compaction, the exposed limestone should be observed and inspected for solution cavities and areas of severely fractured or weathered limestone. If pockets of loose or soft soils or solution features in the form of slots or chimneys are found in the carbonate rock formation, they should be excavated to a depth of three times the feature width or diameter, where applicable, and backfilled with FDOT No. 57 coarse aggregate or lean concrete or grout.

5.0 GENERAL CONSTRUCTION RECOMMENDATIONS

5.1 GENERAL

We recommend that all excavation, trenching and backfilling operations be performed in accordance with the latest MDWASD Standard Specifications and Details for Design and Construction Section 02314 "Excavation, Backfill and Fill for Structural Facility and Utility Systems" and Section 02315 "Trenching and Backfilling for Piping Systems".

5.2 GENERAL STRUCTURAL FILL AND BACKFILL

Structural fill and backfill (other than trench backfill – see **Section 4.4**) should be free of organic matter and consist of granular material containing less than 12 percent passing by dry weight the U.S. Standard No. 200 mesh sieve. The fill material may be composed of either clean sands and/or limerock. The fill material should have no particle size in excess of three inches and have a Unified Soil Classification Systems (USCS) designation of GP, GW, GP-GM, GW-GM, SP, SW, SP-SM or SW-SM. Fill material should be free of wood, trash and other deleterious material.

Structural fill should be placed in level lifts not exceeding 12 inches in loose thickness. Each lift should be compacted to at least 95 percent of the Modified Proctor maximum dry density near the optimum moisture content per ASTM D1557 or AASHTO T-180. Fill to be compacted with a vibratory plate tamper or a small walk behind vibratory roller should be placed in lifts not exceeding six inches in loose thickness.

In place density tests should be performed by a qualified soils technician working under the supervision of a geotechnical engineer in accordance with appropriate AASHTO procedures. Any fill indicating less than the recommended relative compaction should be recompacted until the required density is obtained prior to the placement of subsequent fill lifts, pouring concrete, or placing any structures.

Structural fill or backfill placed below the water table and to a height of one foot above it should consist of a combination of FDOT No. 57 Stone and structural fill material mixed in an approximate 50 percent proportion by volume. Density testing will not be required within this layer; however, the subgrade preparation work should be observed by a representative from our office to confirm that the material is in a stable and unyielding condition.

5.3 PAVEMENT RESTORATION

Pavement restoration should be performed in accordance with Florida Department of Transportation (FDOT), Miami-Dade County Public Works, or specific Municipality Standards. The upper one foot of pavement subgrade should be compacted to at least 98 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557) or AASHTO T-180 using a material that can achieve a minimum Limerock Bearing Ratio (LBR) value of 40. Pavement base materials should be compacted at least 98 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557) or AASHTO T-180 using a material that can achieve at least an LBR of 100.

5.4 GROUNDWATER CONTROL

The extent of groundwater control will depend on the design invert elevation of the pipes and the water level at the time of construction. At a minimum, groundwater control may likely be required for construction excavations at this site for either excavation dewatering or removal of temporarily perched water from a rain event. Based on the results of the drilled borings the ground water table was encountered at a depth of approximately two to 4.4 feet below existing grade at the time of drilling in June 2022. Such water can be controlled by pumping from sumps located in ditches or pits inside the excavation or a well point dewatering system combine with an appropriate bracing and shoring system. Groundwater should be maintained at the following levels:

1. At least one foot below the bottom of any excavation made during construction operations.
2. At least two feet below the surface of any compaction operations.

Since the GWT was encountered at approximately two to 4.4 feet below existing ground, dewatering to greater depths, such as the 30-foot excavation for the pump station, will require well points and temporary bracing-support system to facilitate construction. Dewatering to greater depths may require well points to facilitate construction. Dewatering Systems should be designed and operated so as not to impact adjacent construction. Additionally, the discharge from dewatering Systems should be handled in accordance with current regulatory criteria as related to the same. We recommend that ground water control be performed in accordance with MDWASD Section 02315 "Trenching and Backfilling for Piping Systems".

5.5 EXCAVATIONS

It is mandated by federal regulations that all excavations, whether they be utility trenches be constructed in accordance with the OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial

penalties. Temporary excavations of the existing subsurface materials without the use of lateral support Systems could be performed with maximum side slopes of 2H:1V for granular soils and maximum side slopes of 1H:1V for the natural limestone formation. A trench box or sheet piles can be used to maintain a vertical cut. Soil parameters for the evaluation of temporary lateral support Systems are provided in **Table B** of this report.

6.0 REPORT LIMITATIONS

Our professional services have been performed and findings obtained in accordance with generally accepted geotechnical engineering principles and practices at the time of this report was prepared. This company is not responsible for the conclusions, opinions or recommendations made by others based on this data. No other warranties are implied or expressed. After the plans and specifications are complete, it is recommended that PSI be provided the opportunity to review the final design and specifications, in order to verify that the data is properly interpreted and implemented. At that time, it may be necessary to submit supplemental recommendations.

The scope of evaluation was intended to determine soil conditions within the influence of the proposed water and/or sewer pipelines. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed construction.

This report has been prepared for the exclusive use of **BND Engineers, Inc.**, and their design consultants, for the specific application to the design and MDC Rickenbacker Causeway Comfort Station No. 2 project in Key Biscayne, Florida.

APPENDIX A

SITE VICINITY MAP



FIGURE No.: 1

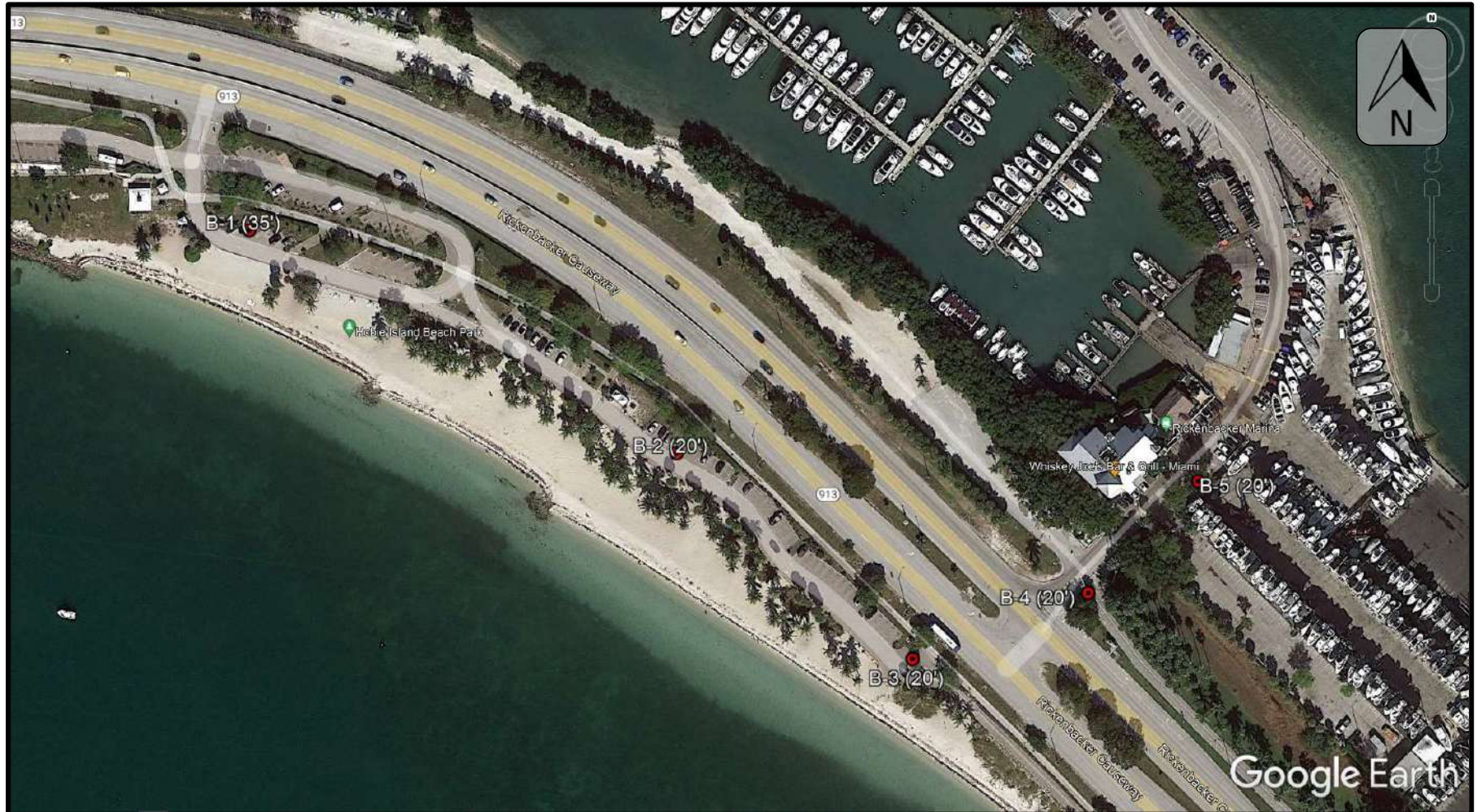
DRAWN BY: AVL

CHECKED BY: JNG

GEOTECHNICAL ENGINEERING SERVICES
MDC Rickenbacker Causeway Comfort Station No 2
Rickenbacker Causeway
Key Biscayne, FL 33149
PSI PROJECT No.: 0397-1674
DATE: 07/11/2022

intertek
psi

BORING LOCATION PLAN



 Approximate Boring Locations

FIGURE No.:	2
DRAWN BY:	AVL
CHECKED BY:	JNG

GEOTECHNICAL ENGINEERING SERVICES
MDC Rickenbacker Causeway Comfort Station No 2
Rickenbacker Causeway
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PSI PROJECT No.: 0397-1674
DATE: 07/11/2022

intertek
psi

APPENDIX B

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON COHESIVE SOILS (Sand, Gravel and Combinations)

Density		Grain Size Terminology		
		<u>Soil Fraction</u>	<u>Particle Size</u>	<u>US Standard Sieve Size</u>
Very Loose	-4 blows/ft. or less			
Loose	-5 to 10 blows/ft.			
Medium Dense	-11 to 30 blows/ft.	Boulders	Larger than 12"	Larger than 12"
Dense	-31 to 50 blows/ft.	Cobbles	3" to 12"	3" to 12"
Very Dense	-51 blows/ft. or more	Gravel: Coarse	¾" to 3"	¾" to 3"
		Small	4.76mm to ¾"	#4 to ¾"
		Sand: Coarse	2.00mm to 4.76mm	#10 to #4
		Medium	0.42mm to 2.00mm	#40 to #10
		Fine	0.074mm to 0.42mm	#200 to #40
		Silt	0.005mm to 0.074 mm	Smaller than #200
		Clay	Smaller than 0.005mm	Smaller than #200

RELATIVE PROPORTIONS FOR NON ORGANIC SOILS

Descriptive Term	%
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

RELATIVE PROPORTIONS FOR ORGANIC CONTENT

Descriptive Term	Organic Content %
Trace	> 1 but < 5
Some	> 5 but < 20
Muck	> 20 but < 75
Peat	> 75

COHESIVE SOILS (Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/sq. ft.)	Field Identification (Approx.) SPT Blows/ft.
Very Soft	Less than 0.25	0 - 2
Soft	0.25 - < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 - 15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification on logs are made by visual inspection.

Standard Penetration Test - Driving a 2.0" O.D., 1^{3/8}" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary for **PSI** to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the drill log (e.g.- 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.).

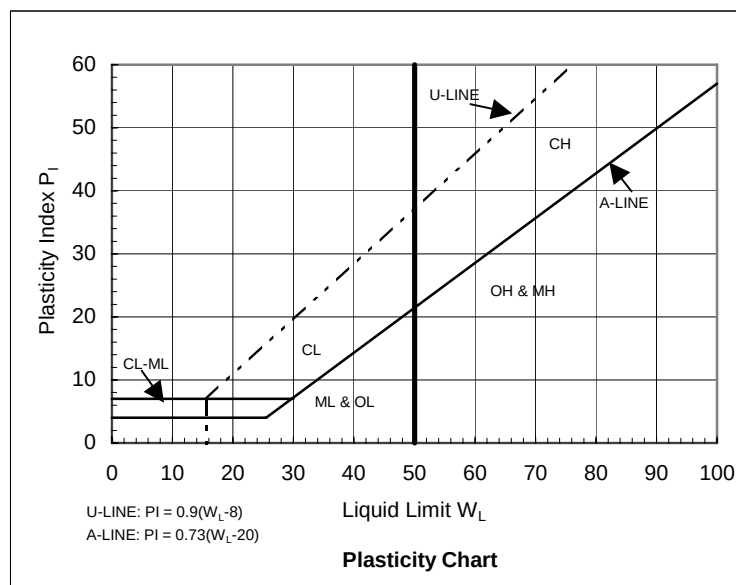
Strata Changes - In the column "Material Description" on the boring logs, the horizontal lines represent approximate transitions between soil types.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

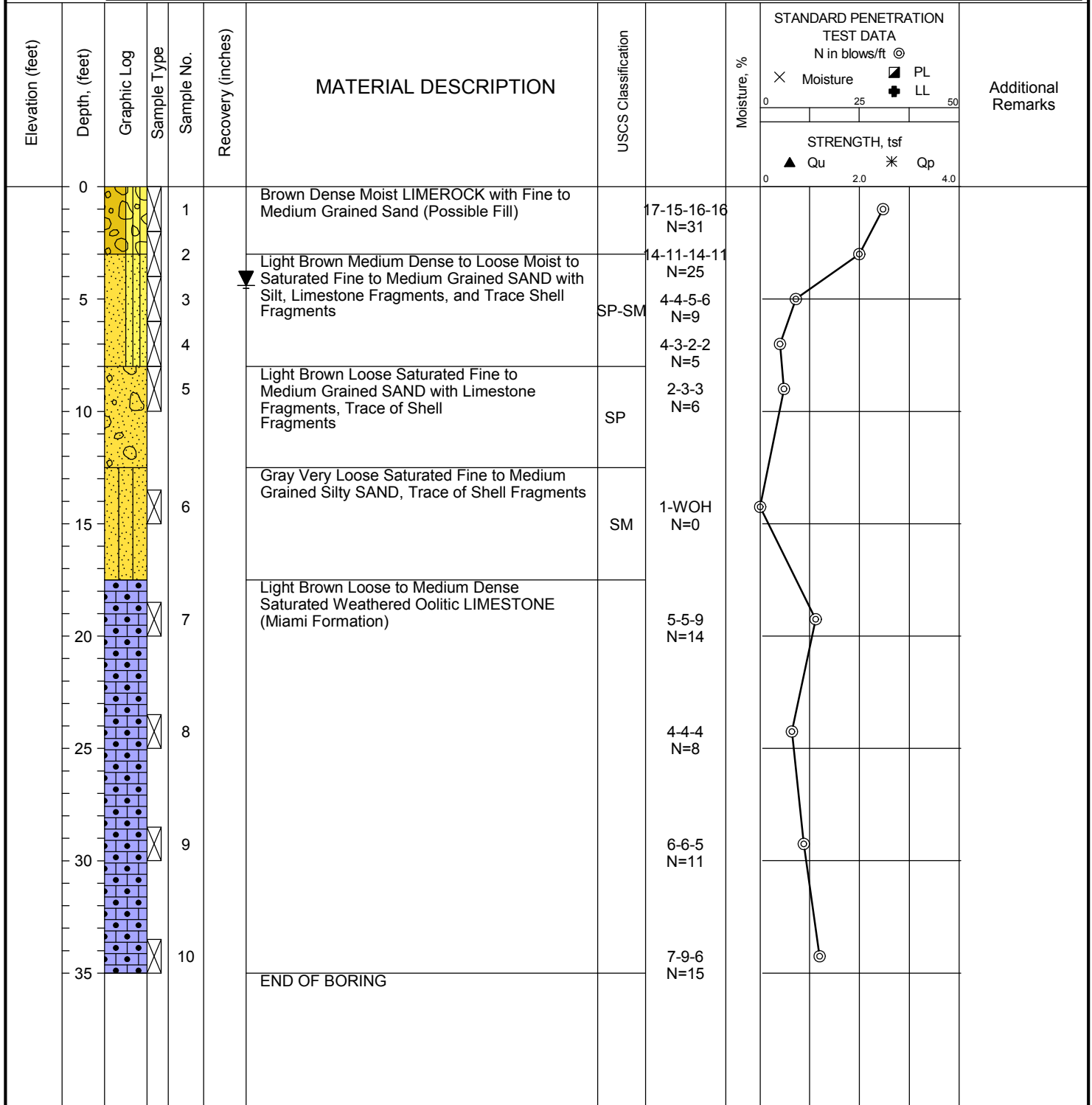
Groundwater symbols: ▽ - observed groundwater elevation, encountered while drilling; ▼ - observed groundwater elevation upon completion of boring; ▮ - observed groundwater elevation after a certain amount of time.

Unified Soil Classification System

Major Divisions			Group Symbol		Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D_{30}^2}{D_{10} D_{60}}$
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM	$\frac{d_u}{u}$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$		Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_C > 3$)		
		Sands with fines (appreciable amount of fines)	SM	$\frac{d_u}{u}$	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$		Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silt and clays (liquid limit >50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays or high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT		Peat and other highly organic soils			



DATE STARTED: 6/22/22		DRILL COMPANY: INTERTEK-PSI		BORING B-1	
DATE COMPLETED: 6/22/22		DRILLER: LR LOGGED BY: LR			
COMPLETION DEPTH: 35.0 ft		DRILL RIG: CME-55		Water ▽ While Drilling ▼ Upon Completion ▽ Delay 4.4 feet 4.4 feet N/A	
BENCHMARK: N/A		DRILLING METHOD: Rotary Drilling			
ELEVATION: N/A		SAMPLING METHOD: SS			
LATITUDE:		HAMMER TYPE: Automatic		BORING LOCATION: See Figure No. 2	
LONGITUDE:		EFFICIENCY: 80%			
STATION: N/A OFFSET: N/A		REVIEWED BY: JNG			
REMARKS: SPT Casing used (Type NW ID 3") from the ground surface to 35.0 feet.					



	Professional Service Industries, Inc.	PROJECT NO.: 0397-1674
	7950 N.W. 64th Street	PROJECT: Rickenbacker Causeway Station No 2
	Miami, FL 33166	LOCATION: Rickenbacker Causeway
	Telephone: (305) 471-7725	Key Biscayne, FL 33149

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 6/22/22	DRILL COMPANY: INTERTEK-PSI	BORING B-2
DATE COMPLETED: 6/22/22	DRILLER: LR LOGGED BY: LR	
COMPLETION DEPTH: 20.0 ft	DRILL RIG: CME-55	Water While Drilling Upon Completion Delay 4.2 feet 4.2 feet N/A
BENCHMARK: N/A	DRILLING METHOD: Rotary Drilling	
ELEVATION: N/A	SAMPLING METHOD: SS	
LATITUDE:	HAMMER TYPE: Automatic	BORING LOCATION: See Figure No. 2
LONGITUDE:	EFFICIENCY: 80%	
STATION: N/A OFFSET: N/A	REVIEWED BY: JNG	
REMARKS: SPT Casing used (Type NW ID 3") from the ground surface to 20.0 feet.		

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
									X Moisture ■ PL ■ LL ▲ Qu ✱ Qp	
0				1		Brown Dense Moist LIMEROCK with Fine to Medium Grained Sand (Possible Fill)	19-18-17-17 N=35			
				2		Light Brown Medium Dense to Loose Moist to Saturated Fine to Medium Grained SAND with Silt, Trace of Shell Fragments	13-11-11-12 N=22			
5				3			9-8-7-8 N=15			
				4			6-4-2-3 N=6			
10				5		Light Brown Loose Saturated Fine to Medium Grained SAND with Limestone Fragments, Trace of Shell Fragments	4-3-3-2 N=6			
				6		Gray Very Loose Saturated Fine to Medium Grained Sandy SILT, Trace of Shell Fragments	3-2-1 N=3			
15				7		Light Brown Medium Dense Saturated Weathered Oolitic LIMESTONE (Miami Formation)	6-6-10 N=16			
20						END OF BORING				

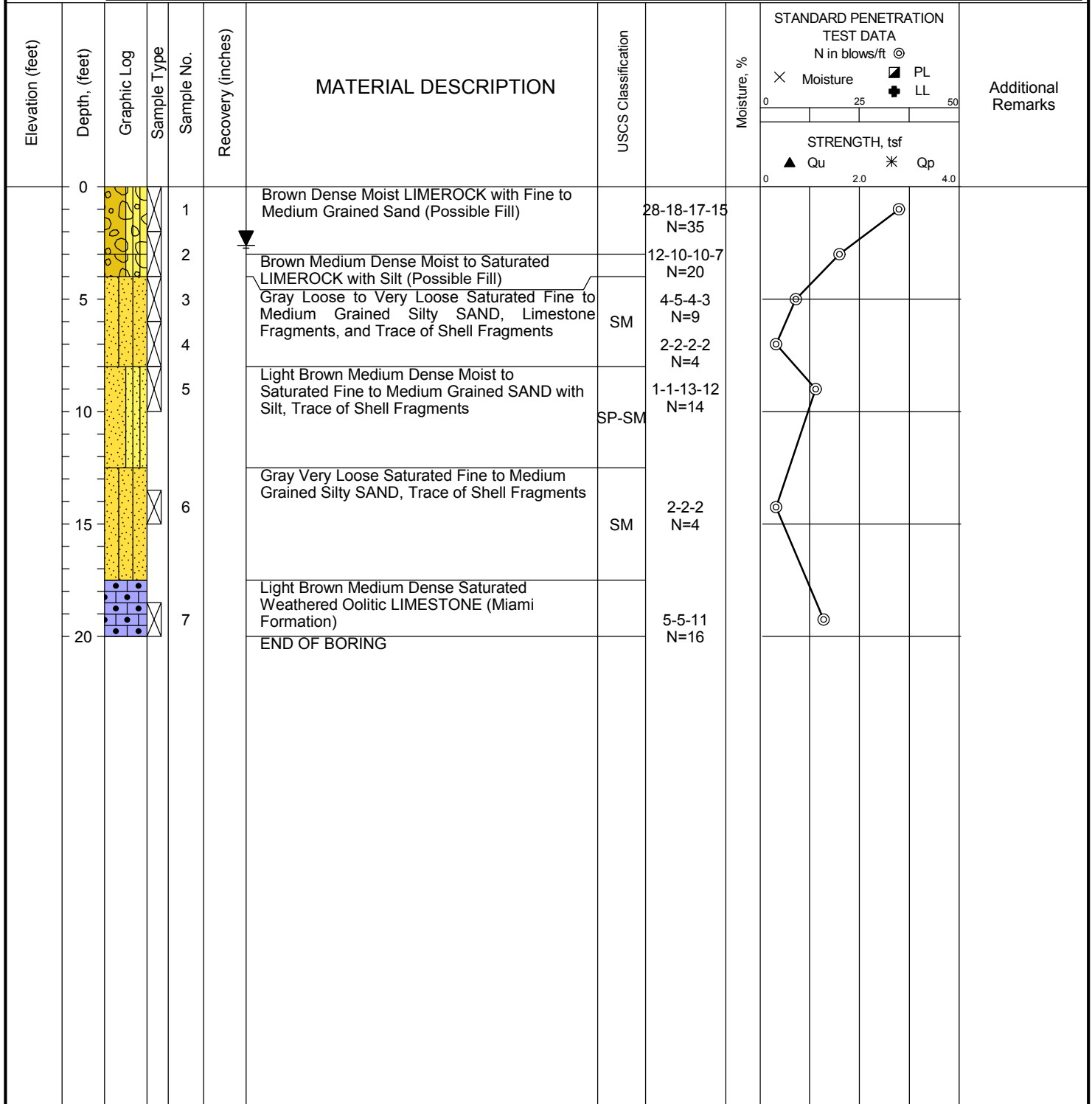
	Professional Service Industries, Inc. 7950 N.W. 64th Street Miami, FL 33166 Telephone: (305) 471-7725	PROJECT NO.: 0397-1674
		PROJECT: Rickenbacker Causeway Station No 2
		LOCATION: Rickenbacker Causeway
		Key Biscayne, FL 33149

DATE STARTED: 6/22/22	DRILL COMPANY: INTERTEK-PSI	BORING B-3
DATE COMPLETED: 6/22/22	DRILLER: LR LOGGED BY: LR	
COMPLETION DEPTH: 20.0 ft	DRILL RIG: CME-55	Water While Drilling Upon Completion Delay 4.0 feet 4.0 feet N/A
BENCHMARK: N/A	DRILLING METHOD: Rotary Drilling	
ELEVATION: N/A	SAMPLING METHOD: SS	
LATITUDE:	HAMMER TYPE: Automatic	BORING LOCATION: See Figure No. 2
LONGITUDE:	EFFICIENCY: 80%	
STATION: N/A OFFSET: N/A	REVIEWED BY: JNG	
REMARKS: SPT Casing used (Type NW ID 3") from the ground surface to 20.0 feet.		

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
									× Moisture ■ PL + LL ▲ Qu ✱ Qp	
0				1		Brown Dense Moist LIMEROCK with Fine to Medium Grained Sand (Possible Fill)		20-23-22-20 N=45		
				2		▼ Light Brown Dense to Medium Dense Moist to Saturated Fine to Medium Grained SAND with Silt, Limestone fragments, and Trace of Shells Fragments	SP-SM	11-15-17-14 N=32		
5				3		Light Brown Very Loose Saturated Fine to Medium Grained SAND with Limestone Fragments, Trace of Shells Fragments		5-6-6-4 N=12		
				4			SP	2-2-2-2 N=4		
10				5				2-1-1-2 N=2		
				6		Gray Very Loose Saturated Fine to Medium Grained Silty SAND, Trace of Shells	SM	1-1-1 N=2		
15				7		Light Brown Medium Dense Saturated Weathered Oolitic LIMESTONE (Miami Formation)		9-8-14 N=22		
20						END OF BORING				

	Professional Service Industries, Inc. 7950 N.W. 64th Street Miami, FL 33166 Telephone: (305) 471-7725	PROJECT NO.: 0397-1674
		PROJECT: Rickenbacker Causeway Station No 2
		LOCATION: Rickenbacker Causeway
		Key Biscayne, FL 33149

DATE STARTED: 6/21/22 DATE COMPLETED: 6/21/22 COMPLETION DEPTH: 20.0 ft BENCHMARK: N/A ELEVATION: N/A LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS: SPT Casing used (Type NW ID 3") from the ground surface to 20.0 feet.	DRILL COMPANY: INTERTEK-PSI DRILLER: LR LOGGED BY: LR DRILL RIG: CME-55 DRILLING METHOD: Rotary Drilling SAMPLING METHOD: SS HAMMER TYPE: Automatic EFFICIENCY: 80% REVIEWED BY: JNG	BORING B-4 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 5%; text-align: center; font-weight: bold;">Water</td> <td style="width: 10%; text-align: center;">▽</td> <td style="width: 65%;">While Drilling</td> <td style="width: 20%; text-align: right;">2.6 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">2.6 feet</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table> BORING LOCATION: See Figure No. 2	Water	▽	While Drilling	2.6 feet	▼	Upon Completion	2.6 feet	▽	Delay	N/A
Water	▽	While Drilling		2.6 feet								
	▼	Upon Completion		2.6 feet								
	▽	Delay	N/A									



	Professional Service Industries, Inc. 7950 N.W. 64th Street Miami, FL 33166 Telephone: (305) 471-7725	PROJECT NO.: 0397-1674 PROJECT: Rickenbacker Causeway Station No 2 LOCATION: Rickenbacker Causeway Key Biscayne, FL 33149

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 6/21/22	DRILL COMPANY: INTERTEK-PSI	BORING B-5
DATE COMPLETED: 6/21/22	DRILLER: LR LOGGED BY: LR	
COMPLETION DEPTH: 20.0 ft	DRILL RIG: CME-55	Water While Drilling Upon Completion Delay 2.0 feet 2.0 feet N/A
BENCHMARK: N/A	DRILLING METHOD: Rotary Drilling	
ELEVATION: N/A	SAMPLING METHOD: SS	
LATITUDE:	HAMMER TYPE: Automatic	BORING LOCATION: See Figure No. 2
LONGITUDE:	EFFICIENCY: 80%	
STATION: N/A OFFSET: N/A	REVIEWED BY: JNG	
REMARKS: SPT Casing used (Type NW ID 3") from the ground surface to 20.0 feet.		

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	Additional Remarks
									TEST DATA N in blows/ft Moisture PL LL STRENGTH, tsf Qu Qp	
	0			1		Brown Medium Dense Moist to Saturated LIMEROCK with Fine to Medium Grained Sand (Possible Fill)	SM		19-14-13-11 N=27	
				2		Gray Medium Dense to Loose Saturated Fine to Medium Grained Silty SAND with Limestone Fragments, and Trace of Shell Fragments	SM		10-8-8-6 N=16	
	5			3		Gray Loose to Medium Dense Saturated Fine to Medium Grained Silty SAND, Trace of Shell Fragments	SM		6-6-4-4 N=10	
				4			SM		4-3-3-3 N=6	
	10			5			SM		2-3-8-10 N=11	
	15			6			SM		3-3-3 N=6	
	20			7		Light Brown Medium Dense Saturated Weathered Oolitic LIMESTONE (Miami Formation)			8-7-9 N=16	
						END OF BORING				

	Professional Service Industries, Inc.	PROJECT NO.: 0397-1674
	7950 N.W. 64th Street	PROJECT: Rickenbacker Causeway Station No 2
	Miami, FL 33166	LOCATION: Rickenbacker Causeway
	Telephone: (305) 471-7725	Key Biscayne, FL 33149



TABLE 1: SUMMARY OF BORING LOCATIONS
MDC Rickenbacker Causeway Comfort Station No 2
Rickenbacker Causeway
Key Biscayne, FL 33149
PSI PROJECT No. 0397-1674

BORING	LATITUDE	LONGITUDE	GROUND SURFACE ELEV. (ft)	BORING DEPTH (ft)	GROUNDWATER DEPTH (ft)	DATE PERFORMED
B-1	25.745900°	-80.177353°	N.A.	35.0	4.4	6/22/2022
B-2	25.745160°	-80.175776°	N.A.	20.0	4.2	6/22/2022
B-3	25.744476°	-80.174905°	N.A.	20.0	4.0	6/22/2022
B-4	25.744694°	-80.174254°	N.A.	20.0	2.6	6/21/2022
B-5	25.745066°	-80.173846°	N.A.	20.0	2.0	6/21/2022

APPENDIX C



TABLE 2: SUMMARY OF LABORATORY TEST RESULTS
MDC Rickenbacker Causeway Comfort Station No 2
Rickenbacker Causeway
Key Biscayne, FL 33149
PSI PROJECT No. 0397-1674

BORING	SAMPLE DEPTH INTERVAL (feet)	% MOISTURE CONTENT	% PASS #200 SIEVE	% ORGANIC CONTENT	USCS CLASS.
B-1	4' - 6'	22.6	6.8	-	SP-SM
	13.5' - 15'	50.1	43.2	5.0	SM
B-2	6' - 8'	23.1	8.3	-	SP-SM
	13.5' - 15'	54.6	68.0	-	ML

**DOMESTIC WASTEWATER COLLECTION/TRANSMISSION
SYSTEM
CONSTRUCTION PERMIT**



Department of Regulatory and Economic Resources
Division of Environmental Resources Management
Water & Wastewater Division
701 NW 1st Court, 7th Floor
Miami, FL 33136-3912
T (305) 372-6920 F (305) 372-6410

**Domestic Wastewater Collection/Transmission System
Construction Permit**

Permit Number: SE-20230119
Township Range Section:
Project: RICKENBACKER CAUSEWAY COMFORT STATION NO. 2 SEWER IMPROVEMENTS PROJECT-31722

Permittee

F.D.E.P

Josiel Ferrer-Diaz, P.E.

MIAMI DADE DEPARTMENT OF TRANSPORTATION & PUBLIC
WORKS
701 NW 1 COURT, SUITE 1700
MIAMI, FL 33136

FDEP Permit #: 277169-850-DWC
Date of Issue: 07/29/2024
Expiration Date: 07/28/2029

This permit is issued under the provisions of Chapter(s) 403.087, Florida Statutes and Florida Administrative Code Rule(s) 62-4 and 62-604. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

TO CONSTRUCT:

A wastewater collection/transmission system connecting the proposed project to the MIAMI-DADE WATER AND SEWER DEPARTMENT CENTRAL DISTRICT W. W. T. P. The new Total Average Daily Flow (ADF) is estimated to be 1900.00 GPD. The system will consist of forcemain and private pump station.

# of Pumps	Pump Type	Operating Capacity (GPM)	TDH (ft)
2	SUBMERSIBLE	21	48

And the following Forcemain lines:

Length (L.F.)	Type	Slope (%)	Diameter (inches)	Material
1400	FORCEMAIN	N/A	8	HDPE
113	FORCEMAIN	N/A	8	DIP

IN ACCORDANCE WITH:

Permit application on FDEP Form 62-604.300(7) (a) with \$300 application fee on 07/23/2024.

LOCATED AT:

Rickenbacker Causeway Comfort Staion No. 2

TO SERVE:

Rickenbacker Causeway Comfort Station No.2

SUBJECT TO:

General Conditions 1-15 and Specific Conditions 1- 11

General Permit Conditions

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions. [62-4.160(1)]
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department. [62-4.160(2)]
3. As provided in subsections 403.987(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in this permit. [62-4.160(3)]
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. [62-4.160(4)]
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. [62-4.160(5)]
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules. [62-4.160(6)]
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:
 - a. Have access to and copy any records that must be kept under conditions of the permit;
 - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated. [62-4.160(7)]

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- A description of and cause of noncompliance; and
 - The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit. [62-4.160(8)]

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules. [62-4.160(9)]
10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard. [62-4.160(10)]
11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department. [62-4.160(11)]
12. This permit or a copy thereof shall be kept at the work site of the permitted activity. [62-4.160(12)]
13. This permit also constitutes:
- Determination of Best Available Control Technology (BACT).
 - Determination of Prevention of Significant Deterioration (PSD).
 - Certification of compliance with State Water Quality Standards (Section 401, PL 92-500).
 - Compliance with New Source Performance Standards. [62-4.160(13)]
14. The permittee shall comply with the following:
- Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - Records of monitoring information shall include:
 - The date, exact place, and time of sampling or measurements;

- ii. The person responsible for performing the sampling or measurements;
 - iii. The dates analyses were performed;
 - iv. The person responsible for performing the analyses;
 - v. The analytical techniques or methods used;
 - vi. The results of such analyses. [62-4.160(14)]
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly. [62-4.160(15)]

Specific Permit Conditions

1. Start of construction prior to fourteen (14) days following to the issuance of this permit is undertaken at owner's risk due to the public's right to object pursuant to Section 120.57 Florida Statutes.
2. This approval is only for the construction of a wastewater collection system and does not relate to the wastewater transmission and treatment aspects. Moreover, this approval does not grant the applicant the right to connect any facilities to be served by this wastewater collection system. In order to connect the applicant shall obtain approval from the receiving utility and a Sewer Capacity Certification Letter (allocation) from DERM, in conformance with the provisions of paragraph 16C of the First Partial Consent Decree (Case No. 93-1109 CIV-MORENO), between the United States of America and Miami-Dade County and section 42.3 of Miami-Dade County Chapter 24. This project will also be contingent upon the placing into service of all the necessary encumbrances by each sanitary sewer utility participating in the transmission of the flows from the point of origin up to the wastewater treatment plant.
3. Provisions must be made to assure uninterrupted service in the area during the time of construction.
4. **At the time of certification of construction-completion and release for use application for the operation of this private sanitary sewer system, submit a completed New PSO Permit Application form, signed by the property owner. In addition, an Operation and Maintenance Manual (O & M Manual) must also be submitted for review and approval.**
5. **A copy of the service agreement between the property owner and the contractor company(s) providing the services to the sewer system in the property and listed in the New PSO Permit Application form shall be submitted for review and approval. The agreement shall be submitted with the PSO application form.**
6. **As part of the PSO permit application requirements for a new or upgraded private sanitary sewer pump station and before the "REQUEST FOR APPROVAL TO PLACE A DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEM INTO OPERATION" application is submitted to RER-DERM, the permittee or his/her contractor must provide and install a Remote Telemetry (RTU) Unit at each pump station in accordance to "RER-DERM Remote Telemetry Unit Guidelines and Requirements" document. The link to the document is: <https://www.miamidade.gov/permits/library/rtu-construction-guidelines.pdf>**

The New PSO Permit Application Form and DERM O&M Manual Requirements-Guidelines can be obtained from the County's Web page at:

<http://www.miamidade.gov/permits/home.asp>

- i. Select "Environment" in the first box, then
 - ii. Select "Operating Permits", in the second box, and then scroll down to "Private Sanitary Sewer Operating Permit". Select "PSO-Permit Application Form". The Forms are on the right hand side.
7. Any modification to this permit shall require approval by this Department before the submittal of the Certification/FDEP Notification of Completion of Construction for a Domestic Wastewater Collection/Transmission.
8. Sanitary sewer 8-inch and larger pipes can't change direction, slope OR pipe size (get larger) without a manhole.
9. Upon completion of construction of this project, the wastewater collection system shall not be placed into service until the Department has received, reviewed, and approved a completely executed Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation, DEP FORM 62-604.300(3)(b), F.A.C.; pages 1 to 7 and the following attachments:
- a) A completely executed Miami-Dade County, Department of Regulatory and Economic Resources (RER), Water & Wastewater Division form: Domestic Wastewater Collection/Transmission Systems Certification of Completion of Construction, page 1 of 1.
 - b) Copy of the Pressure test reports.
 - c) Copy of the Pump Station Start Up test report.
 - d) A set of as-built drawings, signed and sealed.
 - e) A RER-DERM Fee Certification Review based on the number of sheets for each review.

The DEP and the DERM-Domestic Wastewater Collection/Transmission Systems Certification of Completion of Construction forms can be obtained from the County's Web page at:

<http://www.miamidade.gov/permits/home.asp>

- i. Select "Environment" in the first box, then
 - ii. Select "One-Time Permits", in the second box, and then scroll down to "Sewer Extension Permit". The Forms are on the right hand side.
10. DERM shall be notified three (3) days prior to performing infiltration/exfiltration/pressure/PS star-up test(s). Notification shall be emailed to the Water and Wastewater Division at PSO@miamidade.gov. The email notification shall include the SE# and project name. This requirement applies for the private and public systems.

Note: If no notification is received prior to performing the infiltration/exfiltration/pressure/PS star-up test(s), the applicant will be required to perform the re-test(s) and a mandatory inspection will be performed for the second test.

11. INCOMPLETE submittals for certification will be denied. An incomplete submittal is one that is missing: complete as-built drawings, complete field testing, complete startup testing, complete FDEP form, and complete DERM form.

Certification of this project shall not be issued until all Specific Conditions above are submitted and Approved by DERM.

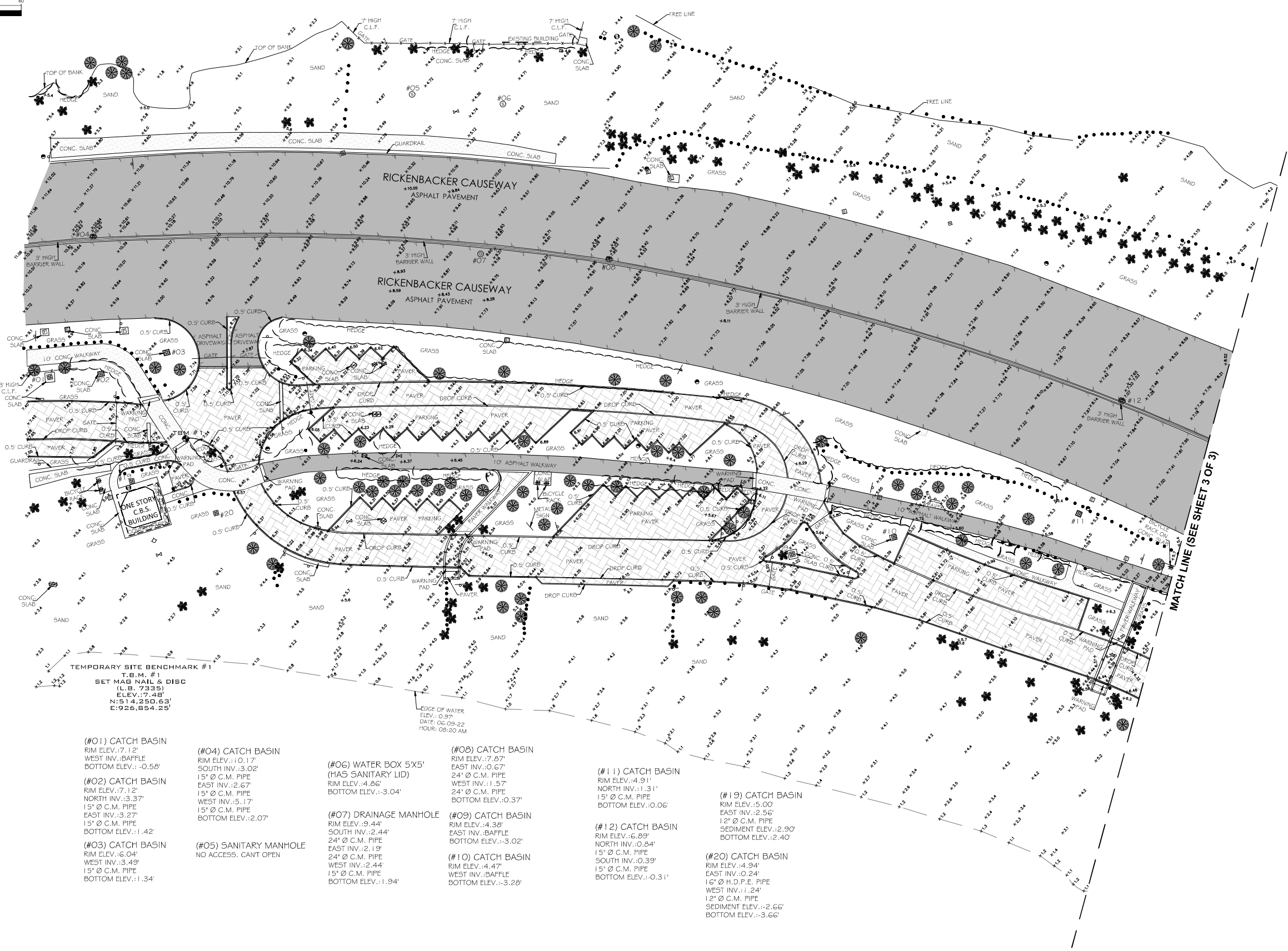
Placing this system into operation without the proper approval from the Department shall constitute a violation of state and county regulations and enforcement actions may be taken accordingly.

29th Day of July, 2024
Miami-Dade County
Division of Environmental Resources Management

For

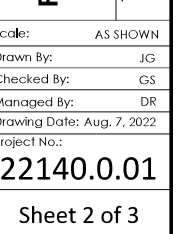
Lisa Spadafina
Director

MAP OF TOPOGRAPHIC SURVEY

[illegible]

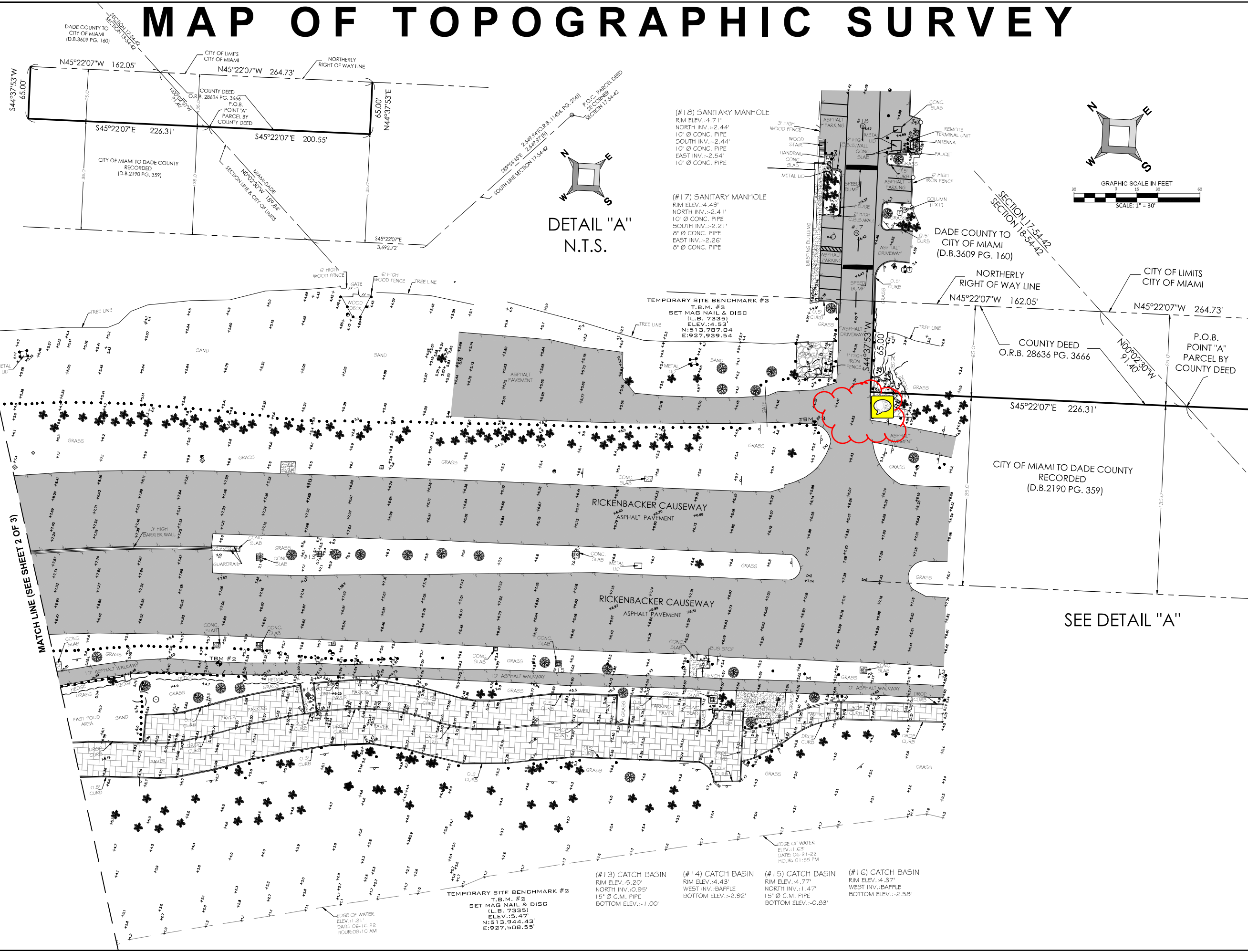
(#20) CATCH BASIN
RIM ELEV.: 4.94'
EAST INV.: 0.24'
16" Ø H.D.P.E. PIPE
WEST INV.: 1.24'
12" Ø C.M. PIPE
SEDIMENT ELEV.: -2.66'
BOTTOM ELEV.: -3.66'

	ASPHALT		PAVER
	PAVER		CONCRETE
	UNIMPROVED		TILE
	GRAVEL		STAMPED CONCRETE



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 5J-17.062, F.A.C.

	PALM TREE
	TREE
	ORNAMENTAL TREE
	TEMPORARY SITE BENCHMARK
	OFFICIAL RECORDS BOOK
	PAGE
	AMERICAN DISABILITY ACT
	INDICATES NUMBER OF PIPES AND THE DIAMETER OF PIPES
	ELEVATION
	SPOT ELEVATION
	STORM
	SANITARY MANHOLE
	GAS
	EXISTING UNDERGROUND COMMUNICATION LINE
	ELECTRIC LINE
	FIBER OPTIC CABLE
	CABLE TELEVISION
	CONCRETE BLOCK STUCCO
	WOOD FENCE
	WOOD GRADE PIPE
	REINFORCED CONCRETE PIPE
	FIRE DEPARTMENT CONNECTION
	(TAKEN AT TREE HEIGHT)
	ORIGINAL GROUND
	HIGH-DENSITY POLYETHYLENE
	CALCULATED AREA
	CORRUGATED METAL PIPE
	CAST IRON
	CENTERLINE
	LENGTH
	INTERNAL ANGLE
	RADIUS
	EXTERNAL ANGLE
	POINT OF COMPOUND
	DEGREE OF CURVE
	VERTICAL CURVATURE
	STATIONING
	INTERSECTION
	IDENTIFICATION
	BEGINNING POINT OF BASELINE
	FLAT BOOK
	BASELINE
	MONUMENTAL LINE
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	ROAD NAME
	TRAFFIC HAND SIGNAL
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	ROAD NAME
	TRAFFIC HAND SIGNAL



WWW.LONGITUDESURVEYORS.COM

No.	Date:	Description	By:
1	04-12-23	ADD INFORMATION COUNTY DEED O.R.B. 28636 PG. 3669	TAM

RICKENBACKER CAUSEWAY COMFORT STATION No.2

ALONG RICKENBACKER CAUSEWAY, KEY BISCAINE, FL

Type of Project:

TOPOGRAPHIC SURVEY

Scale:	AS SHOWN
Drawn By:	JG
Checked By:	GS
Managed By:	DR
Drawing Date: Aug. 7, 2022	
Project No.:	
22140.0.01	
Sheet 3 of 3	