

ADDENDUM NO. 1

TAYLOR ENGINEERING, INC.



**DREDGED MATERIAL MANAGEMENT
AREA BV-11 CONSTRUCTION**

**BREVARD COUNTY, FLORIDA
JULY 27, 2020**



SUMMARY OF AMENDMENTS TO PROJECT SPECIFICATIONS

Division 31: Earthwork is provided. It was missing from the initial specifications PDF.

00 41 63A: Bid Schedule. Bid item 27 revised to clarify “topsoil stripping, stockpiling, and placement.”

SUMMARY OF QUESTIONS AND RESPONSES

1. QUESTION: Is there an engineer’s estimate, or budget number available?

RESPONSE: An engineer’s estimate for this construction project does exist however, at this point in the procurement we will only report that the expected cost of the project will be between \$1,000,000 and \$5,000,000.

2. QUESTION: When I did my earthwork takeoff I started at the crest and use horizontal and vertical offsets to create the toe of slopes, ditch and perimeter road. My model aligned with your drawing except for the south portion of the perimeter road, it has less of an offset than the north and east portion of the perimeter road. Is the road a constant height above the invert of the outer ditch and if so what is it and wouldn’t that cause the east portion of the road to have a varying offset from the crest or the outside slope of the levee to vary? An alignment and profile of the perimeter road would be very helpful.

RESPONSE: CAD design files are available on the FIND website. Perimeter road is not a constant height and varies in elevation. The ditch depth, as measured from the top of slope adjacent to the perimeter road and the ditch invert also varies.

3. QUESTION: Is the cost of the solid 36-inch HDPE pipe included in bid item 24?

RESPONSE: No, it should be included in Item 19. Please refer to specification 01 29 00 (Measurement and Payment), 1.8.H.s

4. QUESTION: Under what bid item is the placement of topsoil be paid for?

RESPONSE: Bid item 27 revised to clarify “topsoil stripping, stockpiling, and placement.”

5. QUESTION: Has the design been engineered to balance the onsite cut and fill? If not, what is the estimated volume for the imported fill?

RESPONSE: The design for this project does have a balanced cut/fill ratio. Other than rock, gravel and other road base-type materials, there is no requirement for importing fill for the embankments.

GENERAL ADDITIONAL INFORMATION TO ALL BIDDERS

1. Bidders are reminded of the following requirement for payment of topsoil and earth fill.

After all earthwork is complete and topsoil has been placed over the site, the final as-built survey will occur which will serve as the final payment survey. For the final payment of earth fill **the amount (volume) of topsoil surveyed while stockpiled at the beginning of construction will be deducted from the final payment volume for other earth fill** (see SECTION 01 29 00 MEASUREMENT AND PAYMENT 1.8 2.a and Drawing Sheet C-2 GENERAL NOTES Estimated DMMA Earthwork Volumes, Note 9).

To ensure proper payment to the Contractor, this means that the Contractor should include the cost for stripping, stockpiling **and placement** of topsoil under bid item 27 TOPSOIL STRIPPING, STOCKPILING, AND PLACEMENT.

Deducting the topsoil volume in this manner alleviates the need to get two final surveys, one before topsoil placement and one after. As written, if it was not deducted, it would result in the Owner paying for the placement of topsoil twice.

SEE SECTION 01 29 00 MEASUREMENT AND PAYMENT, SECTION 31 23 00 DIKE AND EARTHWORK CONSTRUCTION, and DRAWING SHEET C-2 GENERAL NOTES for further details.

Please bid accordingly.



SECTION 00 41 63A. Revised 7-27-2020



BID SCHEDULE

ALL BID ITEMS SHALL INCLUDE ALL COSTS FOR FURNISHING TO THE OWNER ALL MATERIALS, EQUIPMENT AND SUPPLIES, PERMITS, AND FOR ALL COSTS INCURRED IN PROVIDING ALL WORK SHOWN ON THE PROJECT DRAWINGS AND OUTLINED IN THE CONTRACT SPECIFICATIONS FOR THE CONSTRUCTION.

ITEM	DESCRIPTION	UNITS	QUANTITY	UNIT COST	TOTAL COST
SECTION A: GENERAL ITEMS					
LUMP SUM					
01	Insurance	LS	1	\$	\$
02	Mobilization and Demobilization	LS	1	\$	\$
03	Environmental Protection and Erosion Control	LS	1	\$	\$
04	Construction, Payment, and As-Built Surveys	LS	1	\$	\$
05	Construction Materials Testing	LS	1	\$	\$
SECTION B: DMMA CONSTRUCTION					
LUMP SUM					
06	Clearing and Grubbing DMMA Area	LS	1	\$	\$
07	Foundation Preparation	LS	1	\$	\$
08	Toe Drain Gravel, Filter Fabric, 10-inch and 6-inch Collector Pipes	LS	1	\$	\$
09	Roadway Stabilization	LS	1	\$	\$
10	Access Road Pea Gravel and Drain Material	LS	1	\$	\$
11	Pre-cast Concrete Drainage Structures	LS	1	\$	\$
12	Cast-in-Place Concrete Weir Foundation	LS	1	\$	\$
13	Cast-in-Place Concrete Walkway Footers	LS	1	\$	\$
14	Cast-in-Place Concrete Overflow Weir	LS	1	\$	\$
15	Aluminum Walkway	LS	1	\$	\$
16	Steel Box Weirs (3)	LS	1	\$	\$
17	Mobile Storage Container	LS	1	\$	\$
18	30" HDPE Solid Wall Discharge Pipe	LS	1	\$	\$
19	36" HDPE Solid Wall Discharge Pipe	LS	1	\$	\$
20	24" HDPE Corrugated Culverts and Stormwater Pipes	LS	1	\$	\$
21	#4 Erosion Control Stone	LS	1	\$	\$
22	Ditch Rubble Erosion Control Stone	LS	1	\$	\$
23	Grassing	LS	1	\$	\$
24	Roadway Open Cut, Culvert Installation, and Maintenance of Traffic	LS	1	\$	\$
25	Dike Underdrain TV inspection	LS	1	\$	\$
26	Demobilization and Remobilization	LS	1	\$	\$
UNIT COST					
27	Topsoil Stripping, Stockpiling, and Placement	CY	20,000	\$	\$
28	Dike, Perimeter Road, Access Road, Stormwater Pond, and Perimeter Ditch Earth Fill Compaction and Placement (not including topsoil)	CY	170,000	\$	\$

TOTAL BID (ITEMS 01 THRU 28) \$ _____

TOTAL BID PRICE SHALL BE SHOWN IN BOTH WORDS AND NUMBERS. IN CASE OF DISCREPANCIES, THE AMOUNT SHOWN IN WORDS SHALL GOVERN

TOTAL BID PRICE (WRITTEN)

Dollars

Signature of Bidder: _____

Date: _____

Notes:

- (1) Quantities are estimated. Actual quantities may vary.
- (2) All bids must be for the entire work and must have each blank space completed.

Bidder has to sign below that they have read and understood all addendums related to this project. Failure to acknowledge any addendum issued *may* disqualify the Bidder.

Addendum No.1	Date of Receipt:
Addendum No.2	Date of Receipt:
Addendum No.3	Date of Receipt:

NOTICE TO ALL BIDDERS

1	The District reserves the right to waive any informality in any bid, to reject any and all bids, and to delete any part of any of the above items.
2	Changes in the Contract Price and Contract Time require prior authorization in writing from the District and the Engineer, in the form of a Change Order. The Contractor is responsible for verification of all bid quantities and to report to the Engineer any discrepancies found prior to ordering materials and or equipment for construction.
3	Bid prices for the various work items are intended to establish a total price for completing the project in its entirety. The Contractor shall include in the Bid, any item for which a separate pay item has not been established in the Bid Form (under any related pay item), to reflect the total price for completing the project in its entirety.
4	Quantities shown are estimated. Actual quantity may vary due to estimated excavation or fill.
5	Contractor shall meet requirements of all applicable permits and codes (in their current edition).
6	The District will award the bid to the lowest qualified bidder.

Bidder: _____

By: _____

Title: _____

Name of Bidder

Signature of Bidder

Date: _____

SECTION 31 10 00

SITE CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SUMMARY

- A. The work in this section includes furnishing all labor, materials, and equipment necessary to complete any clearing and grubbing of vegetation and debris removal within the construction boundary and as indicated in the Project Drawings. All work shall be done in accordance with all local, State and Federal regulations and requirements.

1.02 DEFINITIONS

- A. Clearing - the felling, trimming, and cutting of trees into sections and the satisfactory offsite disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, etc., occurring in the area of the DMMA basin, dike embankment, laydown yard, drainage ditches, entrance roads, and other areas within the construction boundary as shown on the Project Drawings.
- B. Grubbing - the excavation, removal, and disposal of stumps, roots, and buried debris occurring in the area of the ditch reclamation, DMMA basin, dike embankment, laydown yard, drainage ditches, entrance roads, fence lines, and other areas within the construction boundary as shown on the Project Drawings.
- C. Debris Removal - Debris removal shall consist of the removal and disposal of all on site rubbish including miscellaneous metallic and plastic objects, containers, tires, and all other non-burnable materials, which are not covered by other Bid Items.

1.03 SUBMITTALS

The following submittals shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES.

- A. Vegetative and Rubbish Disposal Verification
 - 1. Verification of proper disposal operations shall be provided to the Engineer for information only within five (5) working days of the commencement of disposal operations and will state where those materials are being disposed.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 PROTECTION

A. Entrance and Access Roads

1. Keep the site entrance and access roads free of cut timber and debris at all times.

B. Trees, Shrubs, and Existing Facilities

1. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

C. Utility Lines

1. Per SECTION 31 23 33 DEWATERING, TRENCHING, BEDDING, AND BACKFILL FOR PIPES, locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - a. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Engineer and the owner of such piping or utility immediately for directions.
 - b. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

3.02 CLEARING

- A. Trees, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface. Resulting vegetation shall be disposed of by hauling off-site and properly disposed.

3.03 GRUBBING

- A. All stumps, roots, snags, and other buried organic or non-organic debris not suitable for foundation purposes shall be excavated and removed. Grubbing shall remove all roots, stumps, limbs and organic or non-organic debris to a depth of not less than 18 inches below the original ground surface. In general, organic stumps or limbs greater than 6 inches in dimension shall be removed. Roots longer than 12 inches and greater than 1 inch in diameter shall be removed. Depressions made by grubbing shall be filled with suitable material and compacted with passes of a tracked or wheeled vehicle as needed to make the surface conform to the surface of adjacent ground. The resulting ground should be smooth, free of ruts, holes, roots, limbs, stumps or debris.

3.04 DISPOSAL OF MATERIALS

A. Vegetative and Woody Materials

1. Logs, stumps, roots, brush, fallen trees and other clearing debris from clearing and grubbing operations shall be disposed offsite. All vegetative and woody materials shall become the property of the Contractor, and shall be disposed in accordance with all local, State and Federal laws, regulations, and requirements.

B. Burning

1. Burning will not be permitted.

C. Rubbish, Metals, and Other Non-wood Debris

1. All rubbish, metals, and other non-wood debris shall be removed from the site and disposed of in an approved disposal site. The material shall be separated from soils by shaking or vibration so that excessive soil is removed. The material should include no more than 10% soil by weight when weighed at the disposal site. This material shall become the property of the Contractor, and shall be disposed in accordance with all local, State, and Federal requirements. Verification of proper disposal and disposal site for subject materials shall be provided to the Engineer within five (5) working days of the materials being removed from the site. No burning of material described in this section will be allowed onsite .

3.05 SITE CLEANUP

- A. The Contractor shall remove all trash, debris, tools, and equipment from the site after completion of the work.

-- END OF SECTION --

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SECTION 31 23 00

DIKE AND EARTHWORK CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work covered by this section includes furnishing all labor, equipment, and materials required to perform all necessary excavation, filling, and grading to construct the dredged material management area including dike, ditches, and roads described herein and in the Project Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. All publications are "Latest Edition" unless specified otherwise.

- A. American Society of Testing Materials (ASTM)
ASTM C33 Standard Specification for Concrete Aggregates
ASTM D1140 Standard Test Methods for Amount of Material in Soils Finer than the No. 200 Sieve
ASTM D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes
ASTM D2922 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3740 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
ASTM D6913 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- B. American Association of State Highway and Traffic Officials (AASHTO)
AASHTO M252 Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe
- C. Florida Department of Transportation (FDOT)
FDOT Standard Specifications for Road and Bridge Construction

1.3 DEFINITIONS

- A. Dike Embankment: The term "dike embankment" as used in these specifications is defined as the earth fill portion of the dike and includes all types of earth fill for the dike, stability berms,

roads, ditches, and all other specified or directed earth fill within the limits of the project, excepting those stone and filter material used for the dike toe drain system.

- B. Dike Embankment Template: The dike embankment template is defined as follows: The bottom vertical limit of the template shall be the surveyed foundation grade. The top vertical limit of the template shall be the finished elevation of the top of dike as defined on the Project Drawings. The horizontal limits of the template shall be from the outside toe of placed/compacted fill necessary to construct the dike, perimeter road, ditch, and ditch berm to the interior toe of placed fill necessary to construct the dike.
- C. FDOT Specifications: Latest edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction.
- D. Fine Material: Fine material shall be defined as the amount of material by dry weight passing the U.S. standard No. 200 sieve (ASTM D1140 or ASTM D6913).
- E. Maximum Density: Maximum density shall be defined as the maximum dry density obtained from modified proctor compaction curves (ASTM D1557) and approved by the Engineer.
- F. Toe Drain: The toe drain is defined as the material making up the dike interior drain system and primarily includes a gravel trench wrapped in filter fabric. The system also includes the perforated and non-perforated collector pipes, filter fabric, concrete inlets, and outlet pipes.
- G. Structure: Footings, foundations, retaining walls, slabs, piles or other man-made stationary features constructed above or below the ground surface.

1.4 SUBMITTALS

The following submittals shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES.

- A. Geotechnical Engineer and Testing Laboratory Credentials
 - 1. The Contractor shall submit the name and credentials of the geotechnical engineering consultant and personnel who will be performing the quality control tests for soil compaction, soil sieve analysis, concrete testing, etc. The company and personnel shall show experience in this type of work and the work shall be overseen by a registered professional engineer.
 - 2. The Contractor shall submit the name and credentials of the testing laboratory which will be performing the material testing for Engineer's approval.
- B. Dewatering Plan
 - 1. Submit a written dewatering plan describing the equipment required and the means and methods required to dewater the site for excavation. Provide sketches as necessary.
 - 2. Submit a copy of any necessary dewatering permits
- C. Toe Drain Material Information
 - 1. Submit manufacturer's information on perforated and non-perforated HDPE collector pipes.
 - 2. Submit test data and gradation curves for toe drain gravel.

3. Submit manufacturer's information on filter fabric for toe drain.
- D. Dike Material Proctor Test Results
1. Submit proctor test results on dike fill borrow material samples from the basin area.
- E. Dike Construction Quality Control Tests and Measurements
- The Contractor shall submit quality control tests to the engineer for approval. These include:
1. Soil density and moisture tests
 2. Soil gradation and classification tests
 3. Toe drain material thickness measurements
 4. Gravel gradation tests
- F. Pipe Bedding Compaction Tests
1. The contractor shall submit a modified proctor (ASTM D1557) per each soil type and in place density testing results for every 200 linear ft of pipe installed but not less than one test per pipe or culvert location.
- G. Foundation Preparation Grading Plan
1. Submit a foundation preparation grading plan to the Engineer for approval. The foundation preparation grading plan shall show the proposed grades and elevations of the foundation in section view and profile view. This may be done by marking the drawing cross sections with red pen (and sketching a profile view) or this may be performed digitally in AutoCAD.
- H. Foundation Survey
1. After topsoil stripping and foundation preparation is completed, submit topographic survey of the project site for Engineer approval.
- I. Payment Surveys
1. Surveys for payment of dike construction shall be submitted at 30-day intervals in accordance with SECTION 01 29 00 MEASUREMENT AND PAYMENT. The Engineer shall have seven (7) working days to examine surveys and make recommendations for payment or non-payment.

1.5 GEOTECHNICAL ENGINEERING CONSULTANT AND TESTING LAB QUALIFICATIONS

- A. Geotechnical Engineer Consultant Testing and Inspection Services: Contractor shall retain a qualified independent geotechnical engineering/testing consultant to perform soil testing and provide quality control testing services during earthwork operations.
- B. Testing Laboratory Qualifications: The geotechnical testing laboratory shall demonstrate to the Engineer's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM D3740, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the work. AASHTO or FDOT certification may be substituted as approved by the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS FOR DIKE EMBANKMENT

A. General

1. Materials for the dike embankment fills shall be acquired from the basin area as shown on the Construction Drawings. The intention is to use the most suitable material obtainable from these sources. Materials containing brush, roots, sod, or other perishable materials, and stones larger than one (1) inch will not be considered suitable.
2. The suitability of the materials shall be subject to quality control tests. Mixing of the borrow materials during the excavating process may be required. The contractor shall not excavate below the finished interior basin elevation shown on the Project Drawings. Any soils excavated from below the water table will require dewatering prior to placement and compaction.
3. The Contractor shall examine the Geotechnical Report(s) before bidding to review the embankment fill material available at the project site.

B. Suitable Material

1. Material considered suitable for dike, road, and general earthwork construction shall consist of an inorganic, granular soil containing between 0 and 12 percent material passing the No. 200 mesh sieve (sand having a Unified Soil Classification of SP or SP-SM).

C. Unsuitable Material

1. Materials which do not comply with the requirements for "Suitable Material" are unsuitable. Additionally, materials unsuitable for use as dike embankment construction fill are defined as follows:
 - a. Material containing more than 4% organic matter (by dry weight)
 - b. Materials classified by the Unified Soil Classification System as PT, OH, OL, CH, SC, MH, SM, GM, GC, GW and GP.
 - c. Materials containing roots greater than one (1) inch in diameter, logs, scrap lumber, metal objects, plastic and fiberglass objects, concrete construction refuse, and other objectionable debris.
 - d. Materials containing brush, sod, organic, and other perishable materials.
 - e. Material containing rocks greater than one (1) inch in diameter.

D. Topsoil Material

1. Material suitable for topsoil shall be natural in-situ topsoil taken from onsite areas within the clearing limits. Unless otherwise approved by the Engineer, suitable topsoil shall be dark colored soils discolored by the organic content of the soil and having at least 1.0 percent organic content by dry weight.

2.2 MATERIALS FOR TOE DRAIN SYSTEM

- A. Toe Drain Gravel: Gravel for the dike drains shall be the size aggregate specified on the Project Drawings. Gravel shall be natural limestone or granite stone having a minimum unit weight of 140 pcf and meeting FDOT specifications for coarse aggregate.
- B. Filter Fabric: Filter fabric shall be Mirafi 1100N non-woven filter fabric or engineer approved equivalent.
- C. 6-inch Diameter Perforated HDPE Drain Pipe: 6-inch diameter perforated drain pipe shall be single wall HDPE corrugated pipe having a manning's n of 0.015 or less and capable of withstanding the cover requirements and construction loads. Pipe and fittings shall meet AASHTO specification M252, type CP, with class 2 perforations. Joints, tees, elbows, and other connections shall interlock so as to withstand a minimum of 40 lbs of tensile force and shall be soil-tight. If the manufacturer provides no test results on the tensile capacity of the joints, the Contractor shall place a minimum of two ½ inch wide beads of 3M Marine 5200 fast-cure adhesive around the inside perimeter of the joints and shall test 3 typical joints to see if the joints can hold a 40 lb tensile force for a minimum of 12 hours.
- D. 6-inch Diameter Non-Perforated HDPE Drain Pipe: 6-inch diameter non-perforated drain pipe shall be single wall HDPE corrugated pipe having a manning's n of 0.015 or less and capable of withstanding the cover requirements and construction loading. Pipe shall meet AASHTO specification M252, type C. Joints, tees, elbows, and other connections shall interlock via mechanical means and shall withstand a minimum of 40 lbs of tensile force and shall be soil-tight.

2.3 HDPE CORRUGATED PIPE AND FITTINGS (GREATER THAN 8 INCH DIAMETER) DRAIN PIPE

- A. HDPE Double Wall Drain Pipe: Corrugated Pipe greater than 8 inches in diameter, pipe specified as culverts or pipe specified as corrugated or double-wall shall be of the diameter listed on the Drawings and shall be HDPE corrugated drain pipe with double wall construction. Pipe shall have a smooth-wall interior with a manning's n of 0.012 or less. Pipe shall be double wall meeting AASHTO specification M252 or M294, type S. Fittings shall be bell-and-spigot type and shall be watertight to a pressure rating of 10 psi per ASTM D3212. Fittings shall be a minimum of 8 ft apart. Pipe lengths less than 8 ft shall not be used unless all remaining pieces are the full ordered length.

2.4 ACCEPTABLE SOILS FOR PIPE BEDDING

Where pipe bedding consists of soil material, soil shall be classified as SP or SP-SM per ASTM D2487 and have a fine material content less than 12% per ASTM D6913.

PART 3 - EXECUTION

3.1 TOPSOIL STOCKPILING AND PLACEMENT

- A. After clearing and grubbing, the Contractor shall strip the specified amount of topsoil from the cleared area and stockpile the topsoil at a location approved by the Engineer. Topsoil shall generally be defined as the near surface dark colored soil stained by organic material having a minimum of 1% organic material by weight and lying within the top 6 inches of the surface.

- B. The Contractor shall make a survey of the stockpiled topsoil and the Contractor's surveyor shall estimate the volume of topsoil available. The Contractor's payment for stripping, stockpiling, placement, and spreading of topsoil will be based on the amount of topsoil calculated in the survey and verified by the Engineer. The Contractor shall evenly spread 4 inches of topsoil on the face of the dike. Any remaining topsoil shall be placed in areas to be grassed as directed by the Engineer until all remaining topsoil has been utilized. All topsoil placed by the Contractor shall be within a tolerance of 3-5 inches thick.

3.2 DEWATERING

- A. The Contractor shall dewater the site as necessary to construct the DMMA. The Contractor shall abide by all state and local laws regarding dewatering of construction sites. The Contractor shall monitor any discharge as necessary to ensure that the discharged water does not violate state water quality standards. The Contractor shall not discharge dewatered effluent to any location onsite except for the DMMA basin area unless approved by the Engineer. The Contractor shall submit a dewatering plan to the Engineer for approval.

3.3 FOUNDATION PREPARATION

- A. Foundation Preparation
 1. Excavate to a point so that the prepared foundation is level when measured perpendicular to the proposed dike centerline. The proposed dike footprint shall be defined as 15 ft (measured perpendicular to the dike centerline) beyond where any proposed cut or fill is required to construct the dike, perimeter road, and perimeter ditch. The intent is to have a roadway like preparation where compaction equipment can work effectively. The Engineer recognizes that the prepared foundation surface will vary in elevation.
 2. Where the foundation intercepts existing dikes or grades having a slope in excess of 15 percent, bench cut the slope as described in the section herein entitled "Fill Placement and Compaction".
 3. Following the establishment of groundwater control, the foundation should be compacted by surface rolling with a self-propelled vibratory compactor. During compaction efforts, groundwater levels shall be maintained a minimum of two (2) ft below the stripped (cleared) ground surface. The compactor should impart a dynamic drum force of not less than 44,000 pounds. Each section of the subgrade shall be subjected to multiple, overlapping (20% overlap) coverages of the compactor as it operates at its full vibrational frequency and at a travel speed of not more than 1.5 miles per hour. Compaction shall continue until no further settlement is visibly discernible at the subgrade surface. In no case, however, should any section of the subgrade receive less than ten (10) coverages with the compactor. Soil in the top twelve (12) inches shall be compacted to 95% maximum density at a moisture content within 2% of optimum as determined by Modified Proctor (in accordance with ASTM D1557).
 4. If during compaction efforts, the soil displays any signs of instability such as pumping, weaving, or shoving, the Contractor shall notify the Engineer. Should weak or instable soil conditions exist the Contractor shall, under direction of the Engineer, excavate the weak soils and store the material onsite. Upon completion of the dike, this material shall be buried in the interior basin unless otherwise directed by the Engineer.
 5. After compaction, thoroughly scarify the ground surface within the entire dike base footprint to a depth of six (6) inches. Run scarifying parallel to the centerline of the dike. All earthwork operations, including excavation, handling, hauling, drying, and compacting

of material shall account for variable groundwater conditions and surface ponding from any recent heavy rains.

B. Foundation Preparation Finished Grade Elevation:

1. The elevation of the prepared foundation surface shall match the existing grade to the greatest extent practical. Unless otherwise approved by the Engineer, excavation (cut) shall be no greater than necessary to provide a reasonable level and gently sloping surface with grades less than 5% measured parallel to the dike centerline and elevation differences less than 6 inches when measured along a line perpendicular to the dike centerline (unless benching is utilized). Excavation (cut) during construction of the foundation shall not be greater than 1 foot below the existing grade except to level humps or high spots less than 500 feet in length as measured parallel to the dike centerline.
2. The Contractor shall submit a foundation preparation plan to the Engineer for approval showing the cross sections and profiles of the proposed foundation grades. The final surveyed foundation elevations shall be within plus or minus 3 inches of the approved foundation grade elevations, unless otherwise directed by the Engineer

C.

1. Upon completion of clearing/grubbing and dike foundation preparation, the contractor shall perform a topographic baseline survey that will be used to determine future earthwork payment quantities. The survey shall encompass the entire area within the limits of clearing including the dike/roadway footprints and the interior basin area. The survey shall also include an area 10 ft outside the perimeter of the limits of clearing. Transects shall be taken perpendicular to the dike centerline at intervals not to exceed 100 ft with individual survey points taken at all breaks in grade or slope and at intervals not exceeding 25 ft on center. The survey shall be submitted to the Engineer for approval in electronic paper version (24x36) and in AutoCAD 2015 or later version containing point elevation data. Horizontal and vertical coordinate systems shall match those used on the Construction Drawings. The survey shall be signed and sealed by a licensed professional surveyor registered in the State of Florida.

3.4 HANDLING OF UNSUITABLE MATERIAL

- A. The Contractor shall separate unsuitable material (as defined in Paragraph 2.1.C) from suitable material during excavation and shall place the material within the basin as directed by the Engineer. Unsuitable material may be temporarily stockpiled in areas within the construction boundary where no construction activities are taking place. Disposal of unsuitable material under or within the dike and other constructed features is expressly forbidden. Dress all areas where unsuitable materials are placed smoothly and evenly. Place a minimum of one foot of sand cover over unsuitable material unless specified otherwise on the Drawings. Unless otherwise approved by the Engineer, the Contractor shall dewater the unsuitable material to the extent necessary to operate heavy tracked equipment over the material and evenly spread and grade any sand cover.

3.5 BASIN EXCAVATION AND DEWATERING

- A. Fill material for DMMA construction shall be taken from the basin area. The Contractor shall excavate the basin to the lines and grades shown on the Drawings and shall dewater the basin area as necessary to maintain moisture control of fill material. The Contractor shall dewater the basin area for final grading.

3.6 FILL PLACEMENT AND COMPACTION

A. General

1. No fill shall be placed on any part of the embankment foundation until such areas have been inspected and approved by the Engineer. The gradation and distribution of material throughout the compacted earth fill section of the dike shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material of the same class. Successive loads of material shall be dumped at locations on the dike as directed or approved.

B. Dike Embankment

1. Scarify the prepared foundation grade to a depth of six (6) inches prior to placing fill. After the first lift is placed, scarify the surface of the previously compacted lift to a depth of three (3) inches and moisten as required for bonding to overlying material. After dumping, the materials shall be spread by approved means in approximately horizontal layers over the entire fill areas. Thoroughly mix embankment materials by disking or harrowing. When succeeding lifts display differences in color or fines content material shall be uniformly mixed to a depth of two (2) ft.
2. Fill shall be placed at a moisture content within plus or minus 2% of the soils optimum moisture content as determined by ASTM D1557. Place fill in lifts 12 inches or less and compact using a vibratory compactor similar to the one used to prepare the foundation. Compact material to a minimum of 95% of the maximum density determined by the Modified Proctor Test (ASTM D1557). If the overlapping tracks of a bulldozer or lightweight vibratory compaction equipment are utilized as the only compaction means, then the fill loose lift thickness shall be reduced to six (6) inches. Construct the dike embankment to the lines, grades, and cross sections indicated on the Project Drawings.
3. Where the prepared foundation grade is too steep or too uneven, material shall be placed by benching.
4. The Contractor shall record field density tests as soon as practically possible after compacting the dike embankment fill.

C. Benching

1. Where benching is required, place and compact the material in horizontal layers. The horizontal face cut into the existing slope shall be a minimum of 6 feet. The vertical face cut into the existing dike resulting from benching shall not be greater than 3 feet in height unless otherwise approved by the Engineer.

D. Backfill for Pipes

1. Backfilling over pipes shall begin as soon as practical after the pipe has been laid, jointed, and inspected.

Place and compact material in lifts. Space between the pipe and sides of the trench shall be packed by hand tamper, up to a level of one foot above the top of the pipe. Contractor shall compact backfill to 90% of maximum density as determined by the Modified Proctor Test (ASTM D1557) in layers not to exceed 4 inches in depth up to the centerline of the pipe from the trench bottom. The backfill shall be carried up evenly on both sides of the pipe.

2. Place remaining material within trench in 6-inch lifts and compact with hand tamper or walk-behind equipment.

3.7 TOE DRAIN SYSTEM INSTALLATION

- A. Toe Drain General: Install the toe drain to the lines and grades shown on the Project Drawings. Place adequate soil or gravel cover over piping to prevent damage before allowing machinery over the buried pipe material.
- B. Quality Control Testing Gravel: The Contractor shall provide gradation tests per ASTM for the first 10 cubic yards delivered to the project site and every 4,000 cubic yards thereafter. If any discrepancies are noted, additional tests shall be required.
- C. Quality Control Toe Drain Dimensions: The geotechnical consultant shall measure and record the width and thickness of the gravel layer at every 300 linear ft (as measured along the dike centerline) and records shall include written documentation of the measured thickness. The geotechnical consultant shall keep written records of the field measurements and submit these in a brief weekly report to the Engineer. If the geotechnical consultant discovers any locations where the gravel thickness is not within specified tolerances described herein, the consultant shall bring it to the Contractor's and Engineer's attention for corrective action. The consultant shall note locations where tolerances were not met, the date corrective action was taken, and shall record the new thickness measurement demonstrating that the material thickness is now within specified tolerances.
- D. Toe Drain Tolerances: The dimensions and tolerances of the gravel toe drain shall be plus or minus 6 inches unless otherwise specified on the Drawings. For perforated pipe placed within gravel backfill, the minimum thickness of gravel cover in any direction as measured from the outside edge of pipe shall be 12 inches.
- E. Pipe Installation and Inspection: Place and compact soil bedding material to 95% maximum density per ASTM D1557. Where gravel or aggregate is specified as bedding material, compact to the requirements specified by the Engineer. Assemble pipes for the full lengths along bedding material and establish the final invert elevations. The slope of the pipe between specified invert elevations shall be straight and true and shall be within the tolerances specified herein. The Contractor and the Contractor's construction surveyor shall install wooden stakes at 25-50 ft on center and shall install a string line along the top of pipe run (as specified on the Drawings) to assist the Engineer in evaluation of the assembled pipe. Notify the Engineer that the pipe is ready for inspection giving at least 48 hours advanced notice.
- F. Survey of Pipe Installation: After the bedding is graded, the pipe is assembled, and the final pipe inverts are set, the Contractor shall survey the horizontal and vertical locations of the pipe before backfilling. Record the pipe elevations on the top of pipe at pipe ends and every 25-35 ft along the pipe run. Where the open end of the pipe is accessible, survey the pipe invert elevation in addition to the top of pipe elevation. For each type/size of pipe, measure the distance from the top of the pipe to the invert and include this information in the survey. Submit the survey results to the Engineer for approval before backfilling. Include the surveyor's data in the as-built survey with the pipe elevations marked invert or top of pipe.
- G. Pipe Installation Tolerances: Pipe shall be installed to within plus or minus 0.1 ft vertically of the specified invert elevation. Between specified invert elevations, pipe shall be placed within plus or minus 0.1 ft vertically of a theoretical straight line drawn between the specified invert elevations. Pipe shall be placed horizontally to within plus or minus 3 inches of the specified horizontal location. Minimum soil cover over the top of pipes shall be 12 inches unless otherwise noted.

- H. Filter Fabric: Install filter fabric of the type specified on the Project Drawings. Stake fabric as necessary to hold in place during backfilling. Lap joints a minimum of 18 inches.
- I. Pipe Inspection: Following completed dike construction, the Contractor shall inspect the toe-drain collector pipes for blockage and crushing by running a remotely controlled television camera through the entire length of each pipe run. The Contractor shall video record the inspection for submittal. The Contractor shall note any locations where damage or excessive settlement has occurred and submit this information along with an inspection report to the Engineer for approval. The Contractor shall repair damaged or settled pipe at no additional cost to the Owner.

3.8 EARTHWORK WORK SEQUENCE

- A. Fill placement for dike construction shall proceed on the lower end first until the partially constructed dike is approximately the same top elevation at any location. Dike construction can then proceed with the requirement that the dike shall be constructed so that the maximum elevation difference is 3 ft at any location along the top of the dike.
- B. The expected work sequence for earthwork is as follows:
 - 1. Clear and grub
 - 2. Strip and stockpile topsoil
 - 3. Prepare dike foundation
 - 4. Construct dike and other earthwork features
 - 5. If unsuitable material is encountered, place unsuitable material in specified final location within the basin area and cover with sand fill
 - 6. Place and spread topsoil over dike and other areas designated for grassing
- C. The Engineer may approve other work sequences proposed by the Contractor with consideration given for environmental impacts, site access, soil erosion, groundwater control, settlement, etc.

3.9 DIKE EMBANKMENT SOIL QUALITY CONTROL TESTING

- A. Determination of Maximum Density
 - 1. The compaction curves provided in the geotechnical report supplied with the specifications are considered preliminary.
 - 2. The Contractor shall collect a minimum of five (5) bulk samples from the excavation area to perform Modified Proctor Test before dike embankment construction begins. All Contractor-supplied tests shall be performed by the approved geotechnical testing firm, and resulting test data shall be signed and sealed by a licensed professional engineer registered in the State of Florida. The Engineer will select the sampling locations and depths for Contractor-supplied testing.
 - 3. The Engineer will determine if these tests may be averaged into previous test results or are suitable to be used to provide a new maximum dry density.
- B. Quality-Control Testing: Dike, Perimeter Road, Ditch, Entrance Roads and Other Earthwork
 - 1. In-Place Density (Compaction) Testing: The contractor's geotechnical engineering consultant shall perform a minimum of one soil density and moisture test for every 1,000 cubic yards of fill placed and compacted but not less three times per week during dike construction. Soil density and moisture testing shall conform to ASTM D6938. The tests

shall be distributed over the dike, stability berms, and roadways as determined by the geotechnical consultant unless otherwise directed by the Engineer. The consultant shall record the elevation, dike station and approximate offset location of each test.

2. Soil Particle-Size (Gradation) Testing and Soil Classification: The contractor's geotechnical engineering consultant shall perform a minimum of one soil gradation test (ASTM D6913) and one soil classification test (ASTM D2487) for every 4000 cubic yards of material placed and compacted but less than once per week during dike construction. The Contractor shall test for organic content as a percent per dry weight every 8000 cubic yards of material, but not less than once every 2 weeks during dike construction. Sampling for gradation testing should occur at locations determined by the geotechnical consultant unless otherwise directed by the Engineer. The consultant shall record the elevation, dike station and approximate offset of the sample location.
3. The Contractor shall obtain test results in a timely manner and take corrective action to repair any part of the project not meeting the requirements of the Specifications.

3.10 DIKE AND EARTHWORK GRADE TOLERANCES

- A. At all points along the dike crest a six (6) inch tolerance above indicated grade will be permitted in the final dressing, provided that any excess material is so distributed that the crown drains freely and that there are no abrupt humps or depressions in surfaces or bulges in the width of the crown. No points along the dike crest shall be below the indicated grade. No payment shall be made for material more than six (6) inches above the design template as measured perpendicular to and above the design template.
- B. The final surveyed foundation elevations shall be within plus or minus 3 inches of elevations indicated on the approved foundation preparation grading plan, unless otherwise directed by the Engineer.
- C. All other earthwork grades including roadways, ditches, shelves and other features shall be within plus or minus 3 inches of the specified grade elevation.

3.11 SLIDES

- A. In the event of slides in any part of the embankment prior to final acceptance of the work, the Contractor shall remove material from the slide area, as directed, and shall rebuild such portion of the embankment. The removal and disposal of material and the rebuilding of the embankment shall be performed without cost to the Owner.

3.12 DIKE AND EARTHWORK FINAL GRADING

- A. Bring the dike to the required grade and cross section at all points. Redress the dike surface as necessary to remove ruts and irregularities to the satisfaction of the Engineer. The Contractor is advised that this may require hand raking to achieve a suitable smooth surface.
- B. The Contractor may utilize fill within the basin area as necessary but the final basin elevation shall be finish graded to within the elevation range shown on the drawings. All ruts and holes greater than 8 inches in depth shall be smoothed. Changes in elevation less than 2 ft shall be accomplished by slopes 10% or shallower and changes in elevation greater than 2 ft shall be accomplished with slopes of 4H:1V or shallower.

3.13 PERIMETER ROADS, ENTRANCE ROADS AND PERIMETER DITCHES

- A. Perimeter roads, entrance roads, and perimeter ditches shall be constructed to the lines and grades shown in the Project Drawings. Final surveys of the perimeter roads, entrance roads, and perimeter ditches shall be included in the as-built survey for the dike construction.

3.14 GRASSING

- A. Apply grassing in accordance with SECTION 32 92 19 GRASSING ESTABLISHMENT.

3.15 DIKE PROTECTION AND MAINTENANCE

- A. Repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact. Where settling occurs before project completion, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
- B. After completion of the dike, maintain and repair the dike crest as necessary to eliminate any ruts or depressions caused by settlement or by the operation of vehicles or equipment for the remainder of the contract period. Leave the dike crest surfaces in such condition that they drain freely at all points. The Contractor shall take special care to protect the completed dike and adjoining areas affected by his operations from erosion with the use of erosion fencing, hay bales, temporary swales, or whatever other means necessary. If erosion occurs, make the necessary repairs immediately.

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Place and grade surplus suitable and unsuitable soil in dike interior following construction. Remove trash and debris, and legally dispose of it offsite.

3.17 PAYMENT SURVEYS

- A. The Contractor shall provide a topographic survey of the project site every 30 days or as needed for payment quantities. The Contractor's survey will serve as the baseline topographic survey to determine pay quantities. The signed and sealed survey shall be submitted to the Engineer for approval in electronic PDF paper version (24-in. x 36-in.) and in a digital AutoCAD file containing point elevation data. Horizontal and vertical coordinate systems shall match those used on the Construction Drawings. When measuring volumes for payment of dike embankment construction, the surveyor shall take survey points on cross sections perpendicular to the dike centerline at approximately every 200 ft.
- B. The as-built survey shall serve as the final payment survey, but the surveyor shall take survey points on cross sections perpendicular to the dike centerline at approximately every 100 ft.
- C. The Contractor's payment survey drawings shall contain the following information:
 - 1. Plan view of the site showing the proposed dike embankment, perimeter road, and perimeter ditch.

2. Plan view shall include 1-ft contour lines for the constructed dike embankment, perimeter road, perimeter ditch, and roads.
 3. Plan view shall contain a table indicating the volume of dike embankment fill placed per each payment survey and a running total of the volume placed.
 4. Cross section views at 200-ft intervals showing the dike embankment template and the most recent payment survey.
 5. Payment survey drawings shall be signed and sealed by a licensed Professional Surveyor registered in the State of Florida.
- D. The Contractor shall submit the electronic AutoCAD files containing point data with each payment survey.
- E. The District may, at its' own expense, retain a qualified survey firm to observe and/or review any and all surveying methods and techniques used by the Contractor. Should the Contractor's methods or techniques not be in accordance with the Specifications, the Engineer will notify the Contractor regarding any discrepancies. The District may also elect to conduct independent quality control surveys at any time without any notice to the Contractor.

3.18 AS-BUILT SURVEY (FINAL PAYMENT SURVEY)

- A. After completion of all constructed features, including topsoil placement, the Contractor shall complete an as-built survey (see SECTION 01 78 00 PROJECT CLOSEOUT) of the completed Dredged Material Management Area. The survey shall display the constructed dike in plan and section views. For comparison purposes, section views shall be superimposed on proposed dike sections from the Construction Drawings. The as-built survey shall display elevations, inverts, and horizontal locations of the dike, walkway, installed weirs, weir pipes, drainage pipe inverts, rip-rap splash pads, vegetation lines, drainage inlets, ditches, roads, and instrumentation. The as-built survey shall be signed and sealed by a registered Florida Professional Surveyor.
- B. The as-built survey shall serve as the final basis for payment quantities for this section. Payment quantities for earthwork shall be determined by a Florida licensed surveyor and shall be verified and approved by the Engineer. The Contractor shall supply the Engineer with the survey's point files and AutoCAD files as necessary to verify final earthwork quantities. In case of an unresolved discrepancy between the Engineer's and the Contractor's estimated earthwork volumes, the Engineer's estimated earthwork quantity will serve as the basis for final payment.

-- End of Section --

SECTION 31 23 33

TRENCHING AND SHORING FOR PIPE INSTALLATION

PART 1 GENERAL

1.01 SUMMARY

- A. This specification addresses the work necessary to perform trenching for pipe installation.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. All publications are "Latest Edition" unless specified otherwise.

- A. Florida Trench Safety Act (90-96, Laws of Florida)
- B. OSHA Excavation Safety Standards 29, CFR part 1926.650 Subpart P
- C. American Society of Testing Materials (ASTM)
 - ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
 - ASTM D2922 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.03 SUBMITTALS

The following submittals shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES.

- A. Trench Shoring Shop Drawings
 - 1. When shoring is required to be structurally designed, the Contractor shall submit shop drawings, signed and sealed by a licensed engineer registered in the State of Florida describing the trench shoring required to install the pipes.
- B. Backfill Compaction Testing
 - 1. Submit results of soil density testing to the Engineer for approval. Perform soil density tests per ASTM D2922 for each pipe or every 200 linear ft of pipe installed, whichever is greater. Perform tests at two vertical levels, at mid-level of pipe and 1 ft above the top of the pipe or as directed by the Engineer.

1.04 GENERAL REQUIREMENTS

- A. The Engineer shall observe the pipe after placement in the trench and before backfilling. The Contractor shall notify the Engineer 48 hours in advance when the pipe is ready for inspection.

- B. Contractor shall not leave open trenches unattended outside of working hours. Contractor shall place temporary fencing around the open trenches at the end of each workday.
- C. All excavation operations shall be in accordance with the Florida Trench Safety Act, which establishes the safety standards of 29 CFR, Part 1926, Subpart P.
- D. Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Engineer and the District of such piping or utility immediately for directions.
 - 2. Cooperate with District and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

1.05 DEWATERING PERMITS

- A. If dewatering is necessary, contractor shall apply and pay for all required dewatering permits.

1.06 TRENCH PROTECTION

- A. Contractor shall construct and maintain sheeting and bracing as required to support the sides of excavations, protect workman and to protect adjacent structures, existing piping and/or foundation material from disturbance, undermining, or other damage. Care shall be taken to prevent voids outside of the sheeting, and if voids are formed, they shall be immediately filled and rammed.
- B. All sheeting and bracing not specified to be left in place shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, existing piping, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering, or otherwise as may be directed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. The Contractor is responsible for selecting the structural system required for trench shoring and bracing.
- B. Backfill: Backfill shall be clean sand having less than 12% fine material passing the 200 sieve.

PART 3 EXECUTION

3.01 GENERAL

- A. All trenching and shoring necessary to complete the Work shall be made by the Contractor and the cost thereof shall be included in the contract price.

3.02 EXISTING UTILITIES

- A. The Contractor must verify the exact location of all utilities through using a third-party utility location service prior to beginning any underground work.
- B. Contactor shall notify all companies with underground utilities in the work area via the state or local "one-call" to obtain utility locates a minimum of 48 hours before planning to begin underground work.
- C. The Contractor shall contact directly, those utilities that do not subscribe to the state or local "one-call" system.

3.03 TRENCH EXCAVATION

- A. Excavation for all trenches required for the installation of pipes shall be made to at least 6 inches greater than the bottom of the pipe unless shown otherwise on the Project Drawings. Excavate trench to provide the minimum clear cover over the pipe bell as specified on the Project Drawings. Excavate in such manner and to such widths as will give suitable room for laying the pipe and compacting the backfill.
- B. The bottom of the trench should consist of in-situ soil of clean sand or stiff clay. Unsuitable soils such as muck, silt, or soft clay shall be excavated to a depth at least 2 ft below the bottom of the pipe and replaced with clean compacted sand backfill.
- C. Unless otherwise approved by the Engineer, dewater the trench area so that the groundwater level is below the bottom of the trench and no seepage can be seen on the sides of the trench.
- D. Provide shoring and bracing as needed to protect workmen and comply with OSHA regulations and Florida law.
- E. Place and compact backfill so that pipe has a rounded bed that will evenly and uniformly support the pipe along its entire length and cross section. Bell holes shall be made as required manually so that there is no bearing surface on the bells and pipes are supported along the barrel only.
- F. Install pipe to the lines and elevations shown on the Drawings. Install pipe joints in accordance with the Drawings and Specifications. Where no instructions are given for joining pipe, install pipe joints in accordance with the manufacturer's instructions or FDOT specifications as directed by the Engineer.
- G. Compact all trench backfill to at least 90% max density as determined by modified proctor unless specified otherwise in the Drawings and Specifications.

--END OF SECTION--

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