Technical Specifications – Issued for Bid

Orange County Master Pump Station Wall Project
PS #3190 – Orange Avenue

Orange County Utilities

June 2014

Prepared For:

Orange County Utilities
Engineering Division
9150 Curry Ford Road
Orlando, FL 32825

Orange County Utilities

Orange County Master Pump Station Wall Project

PS#3190 - Orange Avenue

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BID SCHEDULE

ORANGE COUNTY MASTER PUMP STATION WALL PROJECT
PS #3190 – Orange Avenue

Bidder is to understand that the total bid price is based on the estimated quantities and will control in awarding the Contract as provided in the Instructions to the Bidder. It is further understood that the quantities stated in the Bid Schedule for various items are estimated only and may be increased or decreased as provided in the Contract.

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
1	Master Pump Station Wall Project (PS #3190 Orange Avenue)	1	LS		

Summation of Subtotals for All Items:

TOTAL ESTIMATED BID AMOUNT $_____

Master CIP Technical Specifications Check List

Orange County Utilities - ***rev June 2013***

Preparer: **Damaris Noriega**
Date: **6/17/2014**

Orange County Master Pump Station Wall Project

Prebid Documents	
Required	**Description**
	Bid Package Drawings (.dwg)
	Bid Proposal sheet(s) (.xls)
	Bidder Qualification Requirements
	Engineers Estimate of Probable Construction Cost (.xls)
	Asset Attribute Table (.xls)
	Gravity Main Table (.xls)
	Pipe Deflection Table (.xls)

Techical Specifications		
Required	**Section**	**Title**
DIVISION 1 - GENERAL REQUIREMENTS		
x	01001	General Work Requirements - ***rev May 2013***
x	01010	Summary of Work
x	01021	Soils Report and Other Information
x	01025	Measurement and Payment - ***rev May 2013***
x	01027	Applications for Payment
x	01050	Surveying and Field Engineering
x	01065	Permits and Fees - ***rev Nov 2012***
x	01070	Abbreviations and Symbols
x	01091	Reference Specifications
	01101	Special Requirements (Gravity Inspection Only)
x	01200	Project Meetings
x	01300	Submittals
	01301	Product Substitutions
x	01310	Progress Schedules - ***rev May 2013***
x	01370	Schedule of Values
x	01380	Audio-Visual Documentation
x	01400	Quality Control
x	01410	Testing and Testing Laboratory Services
	01516	Collection System Bypass
x	01560	Erosion and Sedimentation Control - ***rev Nov 2012***
	01570	Maintenance of Traffic
	01580	Project Identification and Signs
	01590	Construction Field Office - ***rev June 2013***
x	01610	Delivery, Storage, and Handling
	01650	Pump Station Start-up and Testing - ***rev Nov 2012***
x	01700	Project Closeout
x	01720	Project Record Documents
	01730	Pump Station Operation and Maintenance Manual
x	01740	Warranties and Bonds
DIVISION 2 - SITE WORK		
x	02050	Demolition of Existing Structures
	02080	Abandonment, Removal and Salvage or Disposal of Existing Pipe
x	02100	Temporary Erosion and Sedimentation Control
x	02140	Dewatering
x	02215	Finish Grading
x	02220	Excavating, Backfilling and Compacting
	02360	Sheet Steel Piling

		Roadwork
	02570	Stabilized Subgrade
	02571	Limerock Base
	02572	Soil Cement Base
	02573	Asphalt Pavement Removal and Replacement
x	02576	Concrete Sidewalks and Driveways
	02577	Stormwater System
x	02578	Solid Sodding
		Pressure Pipe
	02660	Potable Water System
	02661	Wastewater Force Mains
	02662	Reclaimed Water Transmission System
	02665	Horizontal Directional Drilling of Pressure Mains
	02666	Pipe Bursting of Pressure Mains
	02667	Jacking and Boring Pipe
		Wastewater Gravity System Inspection
	02761	Cleaning Sanitary Sewer Systems - ***rev May 2013***
	02762	Televising Sanitary Sewer Systems - ***rev May 2013***
	02763	Televising Sanitary Sewer Laterals
	02764	Televising Existing Manholes
	02765	Smoke Testing Wastewater Collection Systems
		Wastewater Gravity System
	02771	Cure-In-Place Pipe for Sanitary Sewer Renewal - ***rev May 2013***
	02772	Cure-In-Place Pipe for Lateral Renewal - ***rev May 2013***
	02773	Service Lateral Clean-Outs for Televising Access
	02774	Wastewater Gravity Collection System - ***rev June 2013***
	02775	Wastewater Manhole Rehabilitation
	02776	Pipe Bursting of Gravity Sewers
	02777	Close Tolerance Horizontal Directional Drilling for Gravity Mains
		Pump Station
x	02784	Chain Link Fences and Gates
DIVISION 3 - CONCRETE		
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x	03200	Concrete Reinforcement
x	03300	Cast-in-Place Concrete
x	03410	Precast Concrete Structures
x	03600	Grouting
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	09901	Coatings and Linings
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	09910	Prefabricated Fiberglass Liners
	09960	High Performance Ferrous Metal Coatings - ***rev Mar 2013***
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	11305-A	Submersible Pump Schedule
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	13430	Pump Station Control Panels
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	15064	Polyvinyl Chloride (PVC) Pipe and Fittings
	15065	Stainless Steel Pipe and Fittings
x	15066	High Density Polyethylene (HDPE) Pipe and Fittings
	15100	Ancillary Equipment
	15110	Plug Valves
	15111	Gate Valves
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	Appendix B	Forms (Pump Station Start-Up)
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	Appendix G	Memo - EPA - Analytical Methods for Mercury in NPDES Permits
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Standard Drawing Detail Check List

Orange County Utilities rev August 2012

Project: **Orange County Master Pump Station Wall Project**
Preparer: **Damaris Noriega**
Date: **6/17/2014**

Required	Revision Date	Drawing Title	Drawing #
		GENERAL	
	April 11, 2011	Bedding and Trenching -Type A	A101
	April 11, 2011	Bedding and Trenching -Type B	A102
	April 11, 2011	Canal or Drainage Ditch Crossing	A103
	April 11, 2011	Restrained Pipe Table -Water and Reclaimed Water Mains	A104-1
	April 11, 2011	Restrained Pipe Table -Wastewater Force Mains	A104-2
	April 11, 2011	Thrust Collar (150 psi) –Water and Reclaimed Water Mains	A105-1
	April 11, 2011	Thrust Collar (100 psi) – Wastewater Force Mains	A105-2
	April 11, 2011	Bore and Jack	A106
	April 11, 2011	Gate Valve and Box - Water and Reclaimed Water Mains	A107
	April 11, 2011	Butterfly Valve and Box - Water and Reclaimed Water Mains	A108
	April 11, 2011	Plug Valve and Box –Wastewater	A109
	April 11, 2011	Typical Valve Box Cover	A110
	April 11, 2011	Sealed Valve Box, Adjustable	A111
	April 11, 2011	Valve Box Pad	A112
	April 11, 2011	Utility Main Marker	A113
	April 11, 2011	Pipe Locating Wire	A114
	April 11, 2011	Air or Combination Air/Vacuum Release Valve For Water / Reclaimed Water	A115-1
	April 11, 2011	Combination Air/Vacuum Release Valve For Wastewater	A115-2
	April 11, 2011	Air or Combination Air/Vacuum Release Valve In Vault– Wastewater	A115-3
	April 11, 2011	Separation Requirements for Water, Wastewater and Reclaimed Water Mains	A116
	April 11, 2011	Sign For Arial Crossing and Access Barrier for Water and Reclaimed Water	A117
	April 11, 2011	Residential Service Locations (Typical)	A118
	April 11, 2011	Single Family Residential Cul-De-Sac Utility Plan – Water	A119
	April 11, 2011	Water and Reclaimed Water Services (Typical)	A120
	April 11, 2011	MJ Tapping Sleeve and Gate Valve Assembly For Water / Reclaimed Water	A121-1
	April 11, 2011	MJ Tapping Sleeve and Gate Valve with Plug Valve For Wastewater	A121-2
	April 11, 2011	Permanent Blow Off Valve, Manually Operated, Water and Reclaimed Water	A122-1
	April 11, 2011	Temporary Blow Off Valve, Manually Operated, Water and Reclaimed Water	A122-2
	April 11, 2011	Blow Off Valve, Automatic, Water	A122-3

Required	Revision Date	Drawing Title	Drawing #
		WATER DISTRIBUTION	
	April 11, 2011	Water Sample Station	A201
	April 11, 2011	Double Detector Check Valve Assembly	A202
	April 11, 2011	Fire Hydrant Assembly	A203
	April 11, 2011	Fire Line Master Meter Assembly	A204
	April 11, 2011	Swabbing Access Points	A205
		WASTEWATER COLLECTION	
	April 11, 2011	Precast Concrete Manhole	A301
x	April 11, 2011	Gravity Manhole Connection	A302
	April 11, 2011	Manhole in Grass Area	A303
	April 11, 2011	Standard Manhole Frame and Cover	A304
	April 11, 2011	Service Lateral	A305
	April 11, 2011	Force Main to Gravity Sewer Connection	A306
	April 11, 2011	Grease Interceptor	A307-1
	April 11, 2011	Lint Trap	A307-2
		WASTEWATER PUMP STATIONS	
	April 11, 2011	Pump Station General Notes	A401
	April 11, 2011	Duplex Pump Station Design Specification	A402-1
	April 11, 2011	Duplex Pump Station Section	A402-2
	April 11, 2011	Duplex Pump Station Plan	A402-3
	April 11, 2011	Pump Base Plate	A402-4
	April 11, 2011	Duplex Pump Station Site Plan	A402-5
	April 11, 2011	Duplex Pipe Support and Gauge Diaphragm Assembly	A402-6
	April 11, 2011	Triplex Pump Station Design Specifications	A403-1
	April 11, 2011	Triplex Pump Station Section	A403-2
	April 11, 2011	Triplex Pump Station Plan	A403-3
	April 11, 2011	Pump Base Plate	A403-4
	April 11, 2011	Triplex Pump Station Site Plan	A403-5
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	April 11, 2011	Pump Station Plan (Four or More Pumps)	A404-3
	April 11, 2011	Pump Station Site Plan (Four or More Pumps)	A404-4
	April 11, 2011	Wet Well Riser Pipe Support Assembly (Four or More Pumps)	A404-5
	April 11, 2011	Private Pump Station Sign	A405
	April 11, 2011	Chain Link Fence	A406
	April 11, 2011	Pump Station Wall	A407-1
x	April 11, 2011	Cantilever Swing Gate	A407-2
	April 11, 2011	Hose Bibb	A408
	April 11, 2011	Reduced Pressure Backflow Preventer, 2 Inch and Smaller	A409
	April 11, 2011	Electrical Legend	A412
	April 11, 2011	Pump Station Control Panel (240V) Front & Plan View	A413-1
	April 11, 2011	Pump Station Control Panel (240V) Rear View	A413-2
	April 11, 2011	Duplex Pump Control Schematic (240V)	A414

Required	Revision Date	Drawing Title	Drawing #
	April 11, 2011	Pump Station Control Panel (480V) Front & Plan View	A415-1
	April 11, 2011	Pump Station Control Panel (480V) Rear View	A415-2
	April 11, 2011	Duplex Pump Control Schematic (480V)	A416
	April 11, 2011	Duplex Control Panel Enclosure Dead Front Layout	A417
	April 11, 2011	SPD Installation	A418
	April 11, 2011	Pump Station Grounding (Typical)	A419-1
	April 11, 2011	Cover and Door Grounding	A419-2
	April 11, 2011	Ground Test Well	A419-3
	April 11, 2011	Fence Post Grounding (Typical)	A419-4
	April 11, 2011	SCADA Pressure Sensor Water Service	A420
		RECLAIMED WATER DISTRIBUTION	
	April 11, 2011	Reclaimed Water Signage “Do Not Drink Water”	A501
	April 11, 2011	Reclaimed Water signage “Do Not Swim”	A502
	April 11, 2011	Reclaimed Water Master Meter Assembly 4” and Larger	A503
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	August 2012	Service Lateral Repair	A601
	August 2012	Point Repair	A602
	August 2012	Manhole Lining	A603
	August 2012	Liner Termination at Manhole	A604
	August 2012	Liner Termination in Sanitary Sewer	A605
	August 2012	Service Lateral Liner	A606
	August 2012	Manhole Replacement	A607
	August 2012	Fiberglass Manhole Insert System	A608
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	August 2012	Asphalt Pavement Restoration at Manhole Frame and Cover Replacement	A610
	August 2012	Concrete Restoration at Manhole or Wetwell	A611
	August 2012	Permanent Asphalt Pavement Restoration	A612
	August 2012	Temporary Asphalt Pavement Restoration	A613

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SECTION 01001
GENERAL WORK REQUIREMENTS

PART 1 - GENERAL

1.01 NOTICE AND SERVICE

A. In conformance with the requirements of Notice and Service of the General Conditions, all notices or other papers required to be delivered by the Contractor to the County shall be delivered to the office of the Engineering Division, Orange County Utilities Department, 9150 Curry Ford Road, Orlando, FL 32825.

1.02 WORK TO BE DONE

A. The Contractor shall furnish all labor, materials, equipment, tools services and incidentals to complete all work required by these specifications and as shown on the Drawings, at a rate of progress which will ensure completion of the Work within the Contract Time stipulated.

B. All materials, equipment, skills, tools and labor which is reasonably and properly inferable and necessary for the proper completion of the Work in a substantial manner and in compliance with the requirements stated or implied by these Specifications or Drawings shall be furnished and installed by the Contractor without additional compensation, whether specifically indicated in the Contract Documents or not.

C. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, clean up, replacements, and restoration required as a result of damages caused during this construction.

D. The Contractor shall comply with all City, County, State, Federal, and other codes, which are applicable to the proposed construction Work.

E. All newly constructed Work shall be carefully protected from injury in any way. No wheeling, walking, or placing of heavy loads on it shall be allowed and all portions damaged shall be reconstructed by the Contractor at his own expense.

F. Scope of Work: See Section 01010 "Summary of Work" and the Bid Schedule for details.

1.03 DRAWINGS AND PROJECT MANUAL

A. The Work shall be performed in accordance with the Drawings and Specifications prepared by the County/Professional. All work and materials shall conform to the Orange County Utilities Standards and Construction Specifications Manual, latest edition or as indicated in these Specifications or Drawings.

B. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications or other data received from the County/Professional, and shall notify same, in writing, of all errors, omissions, conflicts and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility

for unsatisfactory Work, faulty construction or improper operation resulting there from, nor from rectifying such conditions at his own expense.

C. All schedules are given for the convenience of the County and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quantity of materials and equipment included in the Work to be done under this Contract.

D. Intent:

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified either in the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.

2. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. Such items shall be provided by the Contractor in accordance with the specification on the Drawings.

3. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

E. When obtaining data and information from the Drawings, conflicts, errors, and discrepancies shall be resolved from the documents given the following order of precedence:

1. Agreement
2. Change Orders
3. Addenda
4. Supplementary Conditions
5. Instructions to Bidders
6. General Conditions
7. Specifications (Divisions. 1 through 16)
8. Drawings
9. Dimensions

When measurements are affected by conditions already established or where items are to be fitted into constructed conditions, it shall be the Contractor's responsibility to verify all such dimensions at the site and the actual job dimensions shall take precedence over scale and figure dimensions on the Drawings.

10. Full-size Drawing
11. Large-scale Drawing
12. Small-scale Drawing
13. Advertisement for Bids
14. Bid
15. Bonds
16. Insurance Certificates
17. Insurance Endorsements
18. Affidavits

1.04 PROTECTION AND RESTORATION

A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every means of protection necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the County/Professional. The Contractor shall maintain security to pump station while constructing proposed wall.

B. Protection of Trees and Shrubs

1. Protect with boxes or other barricades.
2. Do not place excavated material so as to injure trees or shrubs.
3. Install pipelines in short tunnels between and under root systems.
4. Support trees to prevent root disturbance during nearby excavation.

C. Tree and Limb Removal

1. Tree limbs, which interfere with equipment operation and are approved for pruning, shall be neatly trimmed and the tree cut coated with tree paint.
2. The County may order the Contractor, for the convenience of the County, to remove trees along the line or trench excavation. The Contractor shall obtain any permits required for removal of trees. Ordered tree removal shall be paid for under the appropriate Contract Items.

D. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by him with new stock of similar size and age, at the proper season and at the sole expense of the Contractor.

E. Lawn Areas: All lawn areas disturbed by construction shall be replaced with like kind to a condition similar or equal to that existing before construction. Where sod is to be removed, it shall be carefully removed, and the same re-sodded, or the area where sod

has been removed shall be restored with new sod in the manner described in the applicable section.

F. Fences: Any fence, or part thereof, that is damaged or removed during the course of the Work shall be replaced or repaired by the Contractor, and shall be left in as good a condition as before the starting of the Work.

G. Where fencing, walls, shrubbery, grass strips or area must be removed or destroyed incident to the construction operation, the Contractor shall, after completion of the Work, replace or restore to the original condition all such destroyed or damaged landscaping and improvements.

H. The cost of all labor, materials, equipment, and work for restoration shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made therefore.

1.05 PUBLIC NUISANCE

A. The Contractor shall not create a public nuisance including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.

B. Sound levels measured by the County/Professional shall not exceed 45 dBA from 8 p.m. to 8 a.m. or 55 dBA 8 a.m. to 8 p.m. This sound level shall be measured at the exterior of the nearest exterior wall of the nearest residence. Levels at the equipment shall not exceed 85 dBA at any time. Sound levels in excess of these values are sufficient cause to have the Work halted until equipment can be quieted to these levels. Work stoppage by the County/Professional for excessive noise shall not relieve the Contractor of the other portions of this specification including, but not limited to, completion dates and bid amounts.

C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.06 CONTRACTOR'S PAYMENTS TO COUNTY FOR OVERTIME WORK

A. County Inspector Work Hours: Normal work hours for the County's inspector(s) are defined as any 8-hour period between the hours of 7:00 a.m. and 7:00 p.m. on the weekdays of Monday through Friday. Any County Inspector(s) work beyond the aforementioned normal work hours shall be requested in writing 48-hours in advance. All overtime and weekend work compensation to the County's Inspector(s) for working beyond the normal working hours are considered overtime compensation and shall be paid for by the Contractor at the overtime pay rate of $51.00 per hour. This overtime pay rate is subject to adjustment by the County. The Contractor agrees that the County shall deduct charges for work outside normal work hours and for overtime pay from payments due the Contractor.

1.07 MAINTENANCE OF SERVICE

A. If this project includes the demolition, rehabilitation and replacement of facilities that transmit wastewater within a wastewater collection system; the collection and transmission of wastewater is a continuous operation and must remain in service at all

times. Unless noted otherwise on the plans, the operation of the existing wastewater pumping facility on each of the respective locations shall remain in service until the transfer of service has been completed. See "Transfer of Service" for additional description of these requirements. In lieu of maintaining the existing pumping station, the Contractor may provide bypass pumping. Bypass pumping provided by the Contractor either as alternate to maintaining the existing pumping facility or as required when noted on the specific facility plan shall meet the requirements as noted in Section 01516 "Collection System Bypass."

B. The Contractor shall, prior to interrupting any utility service (water, sewer, etc.) for the purpose of making cut-ins to the existing lines or for any other purposes, contact the County and make arrangements for the interruption which will be satisfactory to the County.

C. Utility lines that are damaged during construction shall be repaired by the Contractor and service restored within 4-hours of the breakage. The County retains the option of repairing any damage to utility pipes in order to expedite service to the customers. The Contractor will remain responsible for all costs associated with the repair.

1.08 TRANSFER OF SERVICE

A. The Contractor shall use temporary plugs in the existing and proposed sewer lines to control the routing of gravity flow to the active pumping facility during the transfer period. The proposed pumping facility shall be constructed while the existing or bypass facility is in operation. When the County has accepted the proposed facilities and placed the facility into operation, the transfer of service is complete. The Contractor may begin the work of removing the existing facility or bypass pumping equipment. The Contractor shall also install permanent plugs in the sewer pipes to allow abandonment or removal of the existing sewer system and pumping facilities as noted on the plans.

1.09 LABOR

A. Supervision: The Contractor shall keep the Contract under his own control and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the Work personally or shall have a competent, English speaking superintendent or representative, who shall be on the site of the Project at all working hours, and who shall have full authority by the Contractor to direct the performance of the Work and make arrangements for all necessary materials, equipment, and labor without delay.

B. Jurisdictional Disputes: It shall be the responsibility of the Contractor to pay all costs that may be required to perform any of the Work shown on the Drawings or specified herein to avoid any work stoppages due to jurisdictional disputes. The basis for subletting work in question, if any, shall conform to precedent agreements and decisions on record with the Building and Construction Trades Department, AFL-CIO, dated June, 1973, including any amendments thereto.

C. Apprenticeship: The Contractor shall comply with all of the requirements of Section 446, Florida Statutes, for all contracts in excess of $25,000 excluding roadway,

highway or bridge contracts and the Contractor agrees to insert in any subcontract under this Contract the requirements of this Article.

1.10 MATERIALS AND EQUIPMENT

A. MANUFACTURER

1. All transactions with the manufacturers or Subcontractors shall be through the Contractor, unless the Contractor shall request and at the County/Professional's option, that the manufacturer or Subcontractor communicate directly with the County/Professional. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.

2. All workmanship and materials shall be of the highest quality. The equipment shall be the product of manufacturers who are experienced and skilled in the field with an established record of research and development. No equipment will be considered unless the manufacturer has designed and manufactured equipment of comparable type and size and have demonstrated sufficient experience in such design and manufacture.

3. All materials and equipment furnished by the Contractor shall be subject to the inspection, review and acceptance of the County and meet the requirements as outlined in the Orange County Utilities Standards and Construction Specifications Manual. No material shall be delivered to the Work without prior approval of the County/Professional.

4. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Project shall be the new (most current production at time of bid) and unused standard products of recognized reputable manufacturers.

5. Manufactured and fabricated products:

    a. Design, fabricate and assemble in accord with the best engineering and shop practices.
    b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
    c. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.
    d. Products shall be suitable for service conditions as specified and as stated by manufacturer.
    e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
    f. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.11 MANUFACTURER'S SERVICE

A. Where service by the manufacturer is specified to be furnished as part of the cost of the item of equipment, the Work shall be at the Contractor's expense.

B. The services provided shall be by a qualified manufacturer's service representative to check and verify the completed installation, place the equipment in operation, and instruct the County's operators in the operation and maintenance procedures. Such services are to be for period of time and for the number of trips specified. A working day is defined as a normal 8-hour working day on the job and does not include travel time.

C. The services shall further demonstrate to the County/Professional's complete satisfaction that the equipment will satisfactorily perform the functions for which it has been installed.

1.12 INSPECTION AND TESTING

A. General

1. If, in the testing of any material or equipment, it is ascertained by the County/Professional that the material or equipment does not comply with the Contract, the Contractor shall be notified thereof, and he will be directed to refrain from delivering said material of equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material, without cost to the County.

2. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEE, except as may otherwise be stated herein.

B. Cost

1. County shall employ and pay for the services of an independent testing laboratory to perform testing specifically indicated on the Contract Documents or specified in the Specifications and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.

2. The cost of field leakage and pressure tests and shop tests of materials and equipment specifically called for in the Contract Documents shall be borne by the Contractor, and such costs shall be deemed to be included in the Contract price.

3. Notify County employed laboratory a minimum of 48-hours, sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimburse County for laboratory personnel and travel expenses incurred.

4. The Contractor shall pay for all work required to uncover, remove, replace, retest, etc., any work not tested due to the Contractor's failure to provide the 48-hours advance notice or due to failed tests. The Contractor shall also provide compensation for the County/Professional's personnel for required re-testing due to failed or rescheduled testing.

C. Shop Testing

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the worksite until the County/Professional notifies the Contractor, in writing, that the results of such tests are acceptable.

2. Five (5) copies of the manufacturer's actual shop test data and interpreted results thereof, accompanied by a certificate of authenticity notarized and signed by a responsible official of the manufacturing company, shall be furnished to the County/Professional as a prerequisite for the acceptance of any equipment. The cost of shop tests (excluding cost of County's representative) and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor and shall be included in the Contract price.

3. The Contractor shall give notice in writing to the County sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the County shall arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials; or he will notify the Contractor that the inspection will be made at a point other than the point of manufacture; or he will notify the Contractor that inspection will be waived.

4. When inspection is waived or when the County/Professional so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include five (5) copies of the results of physical tests and chemical analysis, where necessary, that have been made directly on the product or on similar products of the manufacturer.

5. The Contractor must comply with these provisions before shipping any material. Such inspections by the County shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

D. Field Testing:

1. The County shall employ and pay for services of an independent testing laboratory to perform testing specifically indicated in the Contract Documents. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract. The Contractor shall provide compensation for retesting of all failed tests.

2. The County may at any time during the progress of the Work, request additional testing beyond that which is specified in the Contract. This testing

will be at the County's expense. The Contractor shall assist the testing laboratory personnel in all ways so as to facilitate access to the location of the material or equipment to be tested. Contractor shall:

a. Cooperate with laboratory personnel, provide access to the Project.
b. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
c. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the testing laboratory.

3. The following schedule summarizes the responsibilities of various tests that may be required by the Contract Documents. Contractor shall notify the County in advance of work so that arrangements can be made with the testing laboratory.

TEST	NOTES	PAID FOR
Low Pressure Air	Each section of ductwork pipe between manholes or lift station	Contractor
Bacteriological	As required by local and state agencies	County
Asphaltic Concrete Paving	As required by County	County
LBR	Each 600 SY of pavement	County
Concrete	Slump test each delivery, cylinders every 20 CY	County
Asbestos	Environmental testing of materials	County
All Other Testing	As specified in various sections of the Project Manual	As Indicated

E. Demonstration Tests: Upon completion of the Work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance or demonstration tests as specified or required to provide compliance with the Contract Documents. The Contractor shall furnish all labor, fuel, energy, water and all other equipment necessary for the demonstration tests at no additional cost to the County.

F. Final Inspection: Prior to preparation of the final payment application, a final inspection will be performed by the County to determine if the Work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents. See also Section 01700 "Project Closeout."

G. Inspection by existing utility owners: The Contractor shall pay for all inspections during the progress of the Work required and provided by the owner of all existing public utilities paralleling or crossing the Work, as shown on the Drawings. All such inspection fees shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made therefore.

H. Inspection by Other Agencies: The Florida Department of Transportation, the Florida Department of Environmental Protection, and other authorized governmental agencies shall have free access to the site for inspecting materials and work, and the Contractor shall afford them all necessary facilities and assistance for doing so. Any instructions to the Contractor resulting from these inspections shall be given through

the County. These rights of inspections shall not be construed to create any contractual relationship between the Contractor and these agencies.

1.13 PROJECT SITE AND ACCESS

A. RIGHT-OF-WAY AND EASEMENTS

1. The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Any earth or other excavated material spilled from trucks shall be removed by the Contractor and the streets cleaned to the satisfaction of the County.

2. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property owner.

3. At the time of the Pre-Construction meetings, the Contractor shall fully acquaint himself with the status of all easements required for the Work and the possibility of parcels remaining to be acquired, if any. Should easements not be acquired by the County in specific areas of the Work, the Contractor shall sequence and reschedule his work therein so as not to interfere with the progress of work in other areas of the Project. Such rescheduling of work shall be performed by the Contractor at no additional cost to the County. The County agrees that it will make every effort to acquire all remaining easements with all speed and diligence possible so as to allow the completion of the Work within the Contract time.

B. ACCESS

1. Neither the material excavated nor the materials or equipment used in the construction of the Work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

2. Access to businesses located adjacent to the project site must be maintained at all times. Contractor may prearrange the closing of business access with the business Owner. Such prearranged access closing shall not exceed two (2) hours. Property drainage and grading shall be restored and all construction debris removed within 48-hours of backfilling trench.

3. Contractor agrees that representatives of the County and any governmental agents will have access to the Work wherever it is in preparation or progress and that the Contractor shall provide facilities for such access and inspection.

1.14 UTILITIES

A. UTILITY CONSTRUCTION

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes, ductwork, and all other appurtenances and facilities pertaining thereto, whether owned or controlled by governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage

or water. Other public or private property, which may be affected by the Work, shall be deemed included hereunder.

2. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required.

3. The length of open trench will be controlled by the particular surrounding conditions, but shall always be confined to the limits described by the County. If any excavation becomes a hazard, or if it excessively restricts traffic at any point, the County may require special construction procedures. As a minimum, the Contractor shall conform to the following restoration procedures:

   a. Interim Restoration: All excavations shall be backfilled and compacted as specified by the end of each working day. For excavations within existing paved areas; limerock base or soil cement base (match existing) shall be spread and compacted to provide a relatively smooth surface free of loose aggregate material. At the end of each workweek, the S-I asphaltic surface course shall be completed and opened to traffic. Contractor shall coordinate his construction activity including density tests and inspections to allow sufficient time to achieve this requirement. All driveway cuts shall be backfilled, compacted, and limerock base spread and compacted immediately after installation. Contractor shall coordinate with the individual property owners prior to removing the driveway section. Any utility crossing an existing roadway, parking lot or other paved area shall be patched by the end of the working day.

   b. All pipe and fittings shall be neatly stored in a location, which will cause the least disturbance to the public. All debris shall be removed and properly disposed of by the end of each working day.

   c. Final Restoration Overlay: After completing all installations, and after testing of the pipe (but no sooner than 30-days after applying the S-I asphaltic surface), final restoration shall be performed. In no event shall final restoration begin after substantial completion. Final restoration shall provide an S-III asphaltic overlay as specified in an uninterrupted continuous operation until completion. Any additional restoration required after testing shall be repaired in a timely manner at no additional cost to the County.

   d. Maintenance of all restored facilities shall be the Contractor's responsibility. This maintenance shall be performed on an on-going basis during the course of construction. The Contractor's Progress Schedule shall reflect the above restoration requirements.

   e. Additional Restoration for Work in Business or Commercial Districts: The Contractor shall restore all private property, damaged by construction, to its original condition. Access to businesses located

adjacent to the project site must be maintained at all times. Contractor may prearrange the closing of business accesses with the business owner. Such prearranged access closing shall not exceed two (2) hours. Property drainage and grading shall be restored within 24-hours of backfilling trench.

B. EXISTING UTILITIES

1. **The locations of all existing underground piping, structures and utilities have been taken from information received from the respective owner. The locations are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping, conduit and cables to be encountered. It is the Contractor's responsibility to verify all depths of marked locates as well as underground structures.**
2. **The Contractor shall, at all times in performance of the Work, employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of existing public utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, public utility services; and shall cooperate fully with the owners thereof to that end.**
3. **Pipelines shall be located substantially as indicated on the Drawings, but the County reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. When the location of piping is dimensioned on the Drawings, it shall be installed in that location; when the location of piping is shown on a scaled drawing, without dimensions, the piping shall be installed in the scaled location unless the County approves an alternate location for the piping. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required. The County/Professional may require detailed pipe laying drawings and schedules for project control.**
4. **The Contractor shall exercise care in any excavation to locate all existing piping and utilities. All utilities, which do not interfere with the completed work, shall be carefully protected against damage. Any existing utilities damaged in any way by the Contractor shall be restored or replaced by the Contractor at his expense as directed by the County. Any existing facilities, which require operation to facilitate repairs, shall be operated only by the owner of the respective utility.**
5. **It is the responsibility of the Contractor to ensure that all utility or other poles, the stability of which may be endangered by the proximity of excavation, be temporarily stayed and/or shored in position while work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice of any such excavation by the Contractor.**

C. NOTICES

6. **All governmental utility departments and other owners of public utilities, which may be affected by the Work, will be informed in writing by the Contractor two (2) weeks after the execution of the Contract or Contracts covering the Work.**

Such notice will be sent out in general, and directed to the attention of the governmental utility departments and other owners of public utilities for such installations and structures as may be affected by the Work.

7. **The Contractor shall also comply with Florida Statute 553.851 regarding notification of existing gas and oil pipeline company owners. Evidence of such notice shall be furnished to the County within two (2) weeks after the execution of the Contract.**
8. **It shall be the Contractor's responsibility to contact utility companies at least 72-hours in advance of breaking ground in any area or on any unit of the Work so maintenance personnel can locate and protect facilities, if required by the utility company.**
9. **The Contractor shall give a minimum five (5) working day notice prior to utility personnel interrupting a utility service (water, sewer, etc.) for the purpose of making cut-ins to the existing lines or for any other purposes, contact the utility owner and make arrangements for the utility personnel to isolate the existing lines thus providing interruption which will be satisfactory to the utility owner.**

D. EXPLORATORY EXCAVATIONS

1. Exploratory excavations shall be conducted by the Contractor for the purpose of locating underground pipelines or structures in advance of the construction. Test pits shall be excavated in areas of potential conflicts between existing and proposed facilities and at piping connections to existing facilities a minimum of 48-hours or 1,000-feet in advance of work. If there is a potential conflict, the Contractor is to notify the County/Professional immediately. Information on the obstruction to be furnished by the Contractor shall include: Location, Elevation, Utility Type, Material and Size. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the County.

E. UTILITY CROSSINGS

1. It is intended that wherever existing utilities must be crossed, deflection of the pipe within specified limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the County this procedure is not feasible, he may direct the use of fittings for a utility crossing or conflict transition as detailed on the Drawings.

F. RELOCATIONS

1. Relocations shown on the Drawings: Public utility installations or structures, including but not limited to light poles, signs, fences, piping, conduits, ductwork, fan, pipe supports, and drains that interfere with the positioning of the Work which are shown on the Drawings to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as part of the general cost of doing the Work and shall be included in the prices bid for the various contract items. No separate payment shall be made therefore.

2. Relocations not shown on the Drawings

a. Where public utility installations or structures are encountered during the course of the Work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the County, removal, relocation, replacement or rebuilding is necessary to complete the Work under this contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the County, for the Contractor to accomplish.

b. If such work is accomplished by the utility having jurisdiction, it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as a Change Order.

3. All existing castings, including valve boxes, junction boxes, manholes, hand holes, pull boxes, inlets and similar structures in the areas of construction that are to remain in service and in areas of trench restoration and pavement replacement, shall be adjusted by the Contractor to bring them flush with the surface of the finished work.

4. All existing utility systems which conflict with the construction of the Work herein, which can be temporarily removed and replaced, shall be accomplished at the expense of the Contractor. Work shall be done by the utility unless the utility approves in writing that the Work may be done by the Contractor.

1.15 RELATED CONSTRUCTION REQUIREMENTS

A. PUBLIC INFORMATION OFFICER

1. The Contractor shall provide community interaction and coordination through a designated Public Information Officer (PIO). The PIO will provide complaint and problem resolutions for community members affected by the construction for the entire project duration. The PIO will manage a 24 hour hotline phone number for citizens to call regarding questions or problems they may experience with respect to the construction activities. The PIO will field these calls, provide answers to questions, research issues with the project team or appropriate agencies and follow up each complaint in a timely manner. The PIO will maintain a daily diary of call and/or interactions with the community, as well as a complaint log chronicling all issues and proposed resolutions.

2. The PIO will attend the monthly project progress meetings and provide the project team with a report of public issues for the previous month. The PIO will also disseminate roadway closures, sewer hookups, temporary and permanent restoration and other relevant construction information to the community, as well as, when appropriate, to the media, emergency services personnel and other interested agencies.

3. The designated PIO shall have previous experience in providing similar services on Orange County Utilities, Orange County Public Works or FDOT construction projects. The PIO shall be bi-lingual (English and Hispanic) and

physically capable of visitation to the construction site, meeting locations and affected resident's homes without special assistance.

B. TRAFFIC MAINTENANCE

1. Refer to specification Section 01550.

C. BARRIER AND LIGHTS

1. The Contractor shall exercise extreme care in the conduct of the Work to protect health and safety of the workmen and the public. The Contractor shall provide all protective measures and devices necessary, in conformance with applicable local, state and federal regulations regarding their need and use. Protective measures shall include but are not limited to barricades, warning lights/flashers and safety ropes.

2. All equipment and vehicles operating within 10-feet of the roadway shall have flashing strobe lights attached.

D. DEWATERING AND FLOTATION

1. The Contractor, with his own equipment, shall do all pumping necessary to dewater any part of the Work area during construction operations to insure dry working conditions. The Contractor shall be completely responsible for any tanks, wetwells or similar structures that may become buoyant during the construction and modification operations due to the ground water or floods and before the structure is put into operation. The proposed final structures have been designed against buoyancy; however the Contractor may employ methods, means and techniques during the various stages of construction (or other conditions), which may affect the buoyancy of structures. Should there be any possibility of buoyancy of a structure; the Contractor shall take the necessary steps to prevent its buoyancy either by increasing the structure's weight, by filling it with approved material or other acceptable methods. Damage to any structures due to floating or flooding shall be repaired or the structures replaced at the Contractor's expense.

2. Contractor shall be responsible for any required permits for the discharge of ground water.

E. DUST AND EROSION CONTROL

1. The Contractor shall prevent dust nuisance from his operations or from traffic by the use of water and deliquescent salts.

2. Erosion and Sedimentation Control

a. Temporary erosion controls include, but are not limited to, grassing, mulching, netting, watering and reseeding on-site surfaces and soil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the County, FDEP and any other agency having jurisdiction.

b. Temporary sedimentation controls include, but are not limited to; silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the County, FDEP and any other agency having jurisdiction.

c. The construction of temporary erosion and sedimentation control facilities shall be in accordance with the technical provision of section 104-6.4 of the 1991 Edition, FDOT Standard Specifications for Road and Bridge Construction.

d. Contractor is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.

F. LINES AND GRADES

1. All Work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, or as given by the County/Professional. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

2. The Contractor shall, at his own expense, establish all working or construction lines and grades as required from the project control points set by the County, and shall be solely responsible for the accuracy thereof.

3. Water main and forcemain shall have a minimum of 36-inches of cover over the top of the pipe. Cover shall vary to provide long uniform gradient or slope to pipe to minimize air pockets and air release valves. The stationing shown on the Drawings for air and vacuum release valve assemblies are approximate and the Contractor shall field adjust these locations to locate these valves at the highest point in the pipeline installed. All locations must be acceptable by the County.

4. To insure a uniform gradient for gravity pipe and pressure pipe, all lines shall be installed using the following control techniques as a minimum:

a. Gravity lines; continuous control, using laser beam technology.

b. Pressure lines; control stakes set at 50-foot intervals using surveyors' level instrument.

G. CUTTING AND PATCHING

1. The Contractor shall do all cutting, fitting or patching of his portion of the Work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the County and in accordance with the Drawings and Specifications.

2. Preparation:

a. Inspect the existing conditions of the Project, including elements subject to damage and/or movement during cutting and patching.

b. Provide adequate temporary support to assure the structural integrity of all facilities during completion of the Work.

3. Performance:

a. Execute cutting and demolition by methods, which will prevent damage to other existing facilities and will provide proper surfaces to receive installation of equipment and repair.
b. Excavation and backfilling shall be performed in a manner, which will prevent settlement and/or damage to existing facilities.
c. All pipes, sleeves, ducts, conduits and other penetration through surfaces shall be made airtight.
d. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.

H. TEMPORARY CONSTRUCTION

1. Temporary fences: If, during the course of the Work, it is necessary to remove or disturb any fencing, the Contractor shall at his own expense, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced. The County/Professional will be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

2. Responsibility for Temporary Structures: In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and save harmless the County from all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

I. DAILY REPORTS

1. The Contractor shall submit to the County's Representative daily reports of construction activities including non-work days. The reports shall be complete in detail and shall include the following information:

a. Days from Notice to Proceed; Days remaining to substantial and final completion.
b. Weather information
c. Work activities with reference to the Critical Path Method (CPM) schedule activity numbers (including manpower, equipment and daily production quantities for each individual activity).
d. Major deliveries
e. Visitors to site
f. Test records
g. New problems, and
h. Other pertinent information

2. A similar report shall be submitted for/by each Subcontractor.

3. The report(s) shall be submitted to the County Representative's Field Office within 2 days of the respective report date. Each report shall be signed by the

Contractor's Superintendent or Project Manager. Pay request will not be processed unless daily reports are current.

4. If a report is incomplete, in error, or contains misinformation, a copy of the report shall be returned by the County Representative to the Contractor's Superintendent or Project Manager with corrections noted. When chronic errors or omissions occur, the Contractor shall correct the procedures by which the reports are produced.

J. CLEANING

1. During Construction

a. During construction of the Work, the Contractor shall, at all times, keep the site of the Work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the County, such material, debris, or rubbish constitutes a nuisance or is objectionable.

b. Provide on-site containers for the collection of waste materials, debris and rubbish and remove such from the site periodically by disposal at a legal disposal area away from the site.

c. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

d. The Contractor shall remove from the site all surplus materials and temporary structures when no longer necessary to the Work at the direction of the County.

2. Final Cleaning

a. At the conclusion of the Work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances. Employ skilled workmen for final cleaning. Thoroughly clean all installed equipment and materials to a bright, clean, polished and new appearing condition. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

b. The Work shall be left in a condition as shown on the Drawings and the remainder of the site shall be restored to a condition equal or better than what existed before the Work.

c. Prior to final completion, or County occupancy, Contractor shall conduct an inspection of interior and exterior surfaces, and all work

areas to verify that the entire Work is clean. The County will determine if the final cleaning is acceptable.

1.16 CONSTRUCTION NOT PERMITTED

A. USE OF EXPLOSIVES

1. No blasting shall be done except upon approval by the County and the governmental agency or political subdivision having jurisdiction. When the use of explosives is approved by the County as necessary for the execution of the Work, the Contractor shall use the utmost care so as not to endanger life or property, and assume responsibility for any such damage resulting from his blasting operations, and whenever directed, the number and size of the charges shall be reduced. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly, "DANGEROUS EXPLOSIVES" and shall be in care of competent watchmen. All permits required for the use of explosives shall be obtained by the Contractor at his expense. All requirements of the governmental agency issuing permit shall be observed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. This Contract is for the Orange Avenue Master Pump Station No. 3190 Improvements located at 8036 South Orange Avenue as shown on the Drawings and specified herein. The Work consists of furnishing all labor, equipment, and materials for the construction of the facilities consisting associated with the following:

1. Removal of existing fence and gate and concrete drive.
2. New 15.5' Precast concrete screen wall with anti-graffiti paint, design and texture.
3. New concrete access drive and gate with removable bollards.
4. Paving and grading with drain pipe.
5. Relocate existing HDPE odor control ductwork, new spool pieces design, and texture. Relocate pipe supports including concrete repair to the pipe supports.
6. Relocation of odor control fan as required to provide a minimum 2.5 feet clearance between the proposed precast concrete wall and extend the concrete support pad as required.
7. Install the Owner provided Mist and Grease Elimination system as shown on the drawings.
8. Provide the County access to the pump station at all times, including the wet well.
9. Provide backtracking provisions at the construction entrance.
10. Remove the existing pump station grounding rods from the existing fence and reinstall on the proposed wall.
11. Coordinate with Sunrail CFRC of the construction work.

B. The Contractor shall furnish all labor, equipment, tools, services and incidentals to complete all Work required by these Specifications and as shown on the Drawings. If conflicts arise between these specifications and the latest OCU Standards and Construction Specification Manual, then the OCU Standards shall govern.

C. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, cleanup, replacements and

restoration required as a result of disruption or damages caused during this Construction.

D. All materials, equipment, skills, tools and labor which is reasonably and properly inferable and necessary for the proper completion of the Work in a substantial manner and in compliance with the requirements stated or implied by these Specification or Drawings shall be furnished and installed by the Contractor without additional compensation, whether specifically indicated in the Contract Documents or not.

E. The Contractor shall comply with all Municipal, County, State, Federal, and other codes which are applicable to this Project.

1.02 WORKING HOURS

A. Working hours for the County Inspector are an 8-hour period between the hours of 7:00 a.m. and 4:00 p.m., Monday through Friday. Any work beyond the 8-hour period is to be requested in writing 48 hours prior and paid for by the Contractor. Any work required on Saturday, Sunday or Holidays shall be requested in writing 48 hours in advance. All requests must be submitted to the County and approved by the County in advance. Under emergency situations, a verbal request may be made with a follow-up written request.

B. The Contractor shall pay the County for County Inspector time outside of normal Working Hours at a rate of $51.00/hour. The Contractor agrees that the County shall deduct such charges from the Contract Amount by a deductive Change Order.

1.03 CONTRACTOR'S USE OF PREMISES

A. The Contractor shall assume full responsibility for the protection and safekeeping of products and materials at the job site. If additional storage or work areas are required, they shall be obtained by the Contractor at no additional cost to the Owner.

1.04 DEMOLITION OF WORK

A. Refer to specification Section 02050.

1.05 SEQUENCE OF WORK

A. The Contractor shall establish his work sequence based on the use of crews to facilitate completion of construction and testing within the specified Contract Time.

B. The sequence of demolition and renovation of existing facilities will be in accordance with the approved demolition and removal plan.

C. The Contractor shall remove the odor control ductwork prior to the installation of the proposed precast concrete wall.

D. The Contractor shall sequence work to maintain a secure site during the removal of the fence and installation of the proposed wall.

1.06 PUBLIC UTILITY INSTALLATIONS AND STRUCTURES

A. The Contractor shall give written notice to all governmental utility departments and other owners of public utilities of the location of the proposed construction operations, at least seventy-two hours in advance of breaking ground in any area or on any unit of the Work.

B. Some of the utility contacts are listed on the plans for the Contractor's convenience.

C. The maintenance, repair, removal, relocation or rebuilding of the public utility installation and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the utility involved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01021
SOILS REPORT AND OTHER INFORMATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Identification of reports of existing conditions.

B. Bidder's/Contractor's responsibilities for investigating and working with existing conditions.

1.02 LAND IN-ADDITION TO THE SITE

A. Contractor is responsible for obtaining any lands, areas, properties, facilities and easements, in addition to those furnished by the County, that the Contractor considers necessary for temporary facilities, storage, disposal of spoil or waste material or other purposes the Contractor determines necessary to complete the Work. Contractor shall provide written documentation from owner to use such land or facilities. The County/ Professional and the Geotech do not assume any responsibility for existing conditions at such lands, areas, properties, facilities and /or easements obtained by the Contractor.

1.03 SUBSURFACE CONDITIONS AND OTHER PHYSICAL CONDITIONS

A. This Section identifies reports of explorations and tests of subsurface conditions, and drawings of physical conditions of existing surface and subsurface structures that have been used in the preparation of the Contract Documents. Contractor may rely upon any technical information and data in those reports found in Appendix A, "Geotechnical Report (includes geotechnical investigation and dewatering ground water quality values per Chapter 62-621, paragraph 62-621.300(2), F.A.C.)." The Report(s) in Appendix A is designated as Authorized Technical Data, but those reports and drawings are not part of the Contract Documents.

B. Any conclusions or interpretations made by the Contractor based on any Authorized Technical Data will be at the Contractor's own risk. Contractor's reliance on any non-technical information, data, interpretations or opinions also will also be at Contractor's own risk. The County/Professional assume no responsibility for any understanding reached or representation made about subsurface conditions and physical conditions of existing structures, except as otherwise expressly shown in or represented by the Authorized Technical Data provided.

C. The only information or data contained in the geotechnical report and used in the preparation of the Contract Documents that may be properly considered authorized technical data concerning subsurface conditions is found in Appendix A

"Geotechnical Report". Such technical data are made available to allow the Contractor to have access to the same information available to the County. The County/Professional do not warrant the accuracy or completeness of any such information or that the Contract Documents identify all the existing relevant reports and/or documents.

1.04 UNDERGROUND UTILITIES

A. Information or data about physical conditions of Underground Utilities, which have been used in the preparation of the Contract Documents, is shown or indicated in the Drawings and technical specifications. Such information and data is based on information and data obtained from record documents or furnished to the County by the owners of those Underground Utilities or by others.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXISTING GROUND SURFACE AND UNDERGROUND CONDITIONS; GENERALLY

A. Where existing ground conditions are shown on the plans hereto attached, the elevations are believed to be reasonably correct but are not guaranteed to be absolutely so, and, together with any schedule of quantities, are presented only as an approximation. The Contractor shall satisfy itself, however, by actual examination of the site of the Work, as to the existing elevations and the amount of work required under the Contract.

B. Where test pits and borings have been dug, the results supplied to the County/ Professional by the soils Engineer may be given on the plans or are on file in the County/Professional's office and available for review . The County does not guarantee the accuracy or correctness of this information. If the Contractor desires any additional information relating to the soils investigation, contact the County/Professional to obtain such information. County does not guarantee the accuracy or correctness of any such information supplied to the Contractor.

C. If, upon notice of a differing subsurface or latent physical condition from the Contractor, the County determines there was no unforeseen condition and unnecessary tests and investigations were conducted solely at the Contractor's request, any unnecessary expenses may be deducted from the Final Payment for the Contract. No increase in Contract Amount or Contract Time will be made if the differing site conditions were known or could have been discovered by the types of examinations that the Contractor, as Bidder, was responsible for. Claims based on groundwater table conditions will not be considered unforeseen subsurface conditions and will not be allowed. Any information indicated in the Contract Documents as to the groundwater table conditions has been provided for general information purposes

only and is not intended to represent that the same conditions will exist during the execution of the Work. Further, no increase in Contract Amount or Contract Time will be made for costs incurred prior to the Contractor's written notice as required by the Contract Documents. The County will be allowed at least 10-days to investigate any alleged differing site conditions and to take appropriate action, before the Contractor is entitled to any adjustment in Contract Amount or Contract Time for Delay.

3.02 UNDERGROUND UTILITIES:

A. The Contractor will be responsible for the safety and protection of, and providing for the repair of any damage done to the Work and existing surface and subsurface structures. The Contractor will be responsible for any damages and injury resulting from the failure to excavate in a careful and prudent manner.

B. Contractor shall have full responsibility for locating 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, stormwater, other liquids or chemicals, or traffic or other control systems, shown or indicated in the Contract Documents, in advance of construction, coordinating the Work with the actual locations found and making note of the actual locations on the record Drawings. Contractor shall exercise extreme caution when locating underground facilities to minimize the risk of damage from Contractor's activities. The Contractor will immediately notify the County and the owner of any Underground Utilities that are inaccurately identified or located on the Drawings.

C. The Contractor will be responsible for any delay and all costs relating to the obligations set forth in this Section, except as provided by allowances specific to Underground Utilities.

D. The Contractor will promptly notify the County, in writing, whenever the Contractor discovers that actual physical conditions of Underground Utilities differ materially from those indicated by the Contract Documents or Authorized Technical Data provided with the Contract Documents. Further, the Contractor promptly will notify the County, in writing, whenever the Contractor encounters Underground Utilities not shown or indicated in/through the Contract Documents, and which could not reasonably have been foreseen.

E. The County and Contractor will follow the provisions of the General Conditions with respect to any conclusions reached by the County after the County compares the actual underground utility conditions with those included in the information provided to the Contractor.

3.03 ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

A. The Contractor will not, at any time, cause or permit any Hazardous Materials to be brought upon, stored, manufactured, blended, handled, or used in, on, or about the Project or the Site for any purpose except as lawful and necessary and in accordance with the Contract Documents. The Contractor will not cause or permit Hazardous Materials to be brought on Site unless they have been specifically pre-identified by the Contractor, and approved in writing in advance by the County.

B. The Contractor will defend, save, indemnify and hold harmless the County, their agents and employees from and against all liabilities, claims, damages, losses and expenses including attorneys' fees, which arise at any time during or after completion of the Work as a result of or in connection with:

1. The Contractor's breach of any prohibition or requirement set forth in this Section or,

2. Any Hazardous Materials discharged, released, deposited or introduced in the soil or surface or groundwater in, on, under, or about the Work, the Site or other properties as a result of the activities of the Contractor, the Subcontractors and their respective agents and employees in connection with the Work.

C. This Contractor's indemnity obligation includes without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, remediation, removal, or restoration required by the County or any federal, State, or local Public Agency because of:

1. The occurrence of any Hazardous Materials present in the soil or surface or groundwater in, on, under, or about the Work or the Site;

2. The diminution in value of the Work or the Site;

3. Damages for the loss or restriction on use of the Work or of any amenity of the Work or the Property; and/or

4. Amounts paid in settlement of claims, penalties, attorneys' fees, court costs, consultant and laboratory fees and experts' fees.

D. The Contractor will immediately notify the County in writing of any significant release of Hazardous Materials at the Project or the Site, specifying the nature and quantity of the release, the location of the release, and the measures taken to contain and clean up the release and ensure that future releases do not occur.

E. The Contractor agrees that insulation and any other construction materials containing asbestos or urea formaldehyde will not be used on the Work, and that all Sub-agreements will prohibit the use of construction materials (including, but not limited to, insulation) containing asbestos or urea formaldehyde.

3.04 DIFFERING HAZARDOUS MATERIAL CONDITIONS:

A. If the Contractor unexpectedly encounters material reasonably believed to be Hazardous Material, the Contractor will immediately stop all affected Work, give written notice to the County and take appropriate health and safety precautions. Unless the Contract Documents require otherwise, the Contractor will conduct an investigation. If upon due investigation, the Contractor determines the material a Hazardous Material that may present a danger to persons or the surroundings, the Contractor will recommend a solution to the County. In any such case, the affected Work will be considered to have been under a suspension of Work.

B. If the Hazardous Material is not required Work under the Drawings and/or Specifications, the County will proceed to have the Hazardous Material removed or rendered harmless through a Change Order or by means of another contract or as the County otherwise deems expedient. Alternatively, the County will terminate the affected Work or Contract for the County's convenience.

C. If the County did not elect termination, once the Hazardous Material has been removed or rendered harmless, the affected Work will be resumed as directed in writing by the County. Any determination by the Florida Department of Community Health or the Department of Environmental Quality that the Hazardous Material has been removed or rendered harmless will be binding upon the County and Contractor for the purposes of resuming the affected Work.

D. If the Contractor is responsible for the Hazardous Material, the Contractor will bear its proportionate share of the delay and costs involved in cleaning up the Site and removing and rendering it harmless to the satisfaction of the County and all Political Subdivisions with jurisdiction. The Contractor will be solely responsible if the Hazardous Material was brought to the Site by the Contractor, or results in whole or in part from any violation by the Contractor of any applicable Laws.

E. If the Contractor is responsible, but fails to take appropriate action, and the County acts accordingly, the Contractor will defend, save, indemnify and hold harmless the County from and against all claims arising from the County's exercise of appropriate action.

F. If the Contractor is not responsible, the County will issue a Change Order with the necessary changes. The Change Order will adjust Contract Amount and/or Contract Time as made necessary by the changes and resulting unreasonable delay under the circumstances attributable to the County /Professional.

3.05 INCIDENTS WITH ARCHAEOLOGICAL FEATURES:

A. The Contractor will immediately notify in writing, the County and all Federal, State and local agencies with jurisdiction of any Archaeological Feature deposits encountered or unearthed. The Contractor will protect such Archaeological Features

in a proper and satisfactory manner. No further disturbance of the Archaeological Features will take place until work is allowed to resume in the affected areas.

B. If the County concludes that the Contract Documents require changes because of Archaeological Feature deposits encountered, the County will issue a Change Order with the necessary changes in the Work. The Change Order also will adjust Contract Amount and/or Contract Time as made necessary by those changes and by any resulting unreasonable delay under the circumstances attributable to the County/Professional.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. This Section specifies administrative and procedural requirements to define pay items and determine payable amounts, and includes but is not limited to:
   1. General Provisions
   2. Cash Allowances
   3. Work Not Paid for Separately
   4. Measurement for Payment
   5. Partial Payment for Stored Materials and Equipment

1.02 GENERAL PROVISIONS

A. This specification includes standard descriptions for all bid items. This Contract's specific bid items are listed in the Bid Schedule.

B. The total Contract Amount shall cover the Work required by the Contract Documents. All costs in connection with the successful completion of the Work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All Work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices bid.

C. If used, all estimated quantities stipulated in the Bid Schedule or other Contract Documents are approximate and are to be used only (a) for the purpose of comparing the bids submitted for the Work, and (b) as a basis for determining an initial Contract Amount. The actual amounts of Work completed and materials furnished under unit price items may differ from the estimated quantities. The County does not expressly or by implication represent that the actual quantities involved will correspond exactly to the quantities stated in the Bid Schedule; nor shall the Contractor plead misunderstanding or deception because of such estimate or quantities or of the character, location or other conditions pertaining to the Work. Payment to the Contractor will be made only for the actual quantities of work performed or material furnished in accordance with the Drawings and other Contract Documents, and it is understood that the quantities may be increased or decreased as provided in the General Conditions.

D. If used, the unit prices listed in the Bid Schedule shall include all services, obligations, responsibilities, labor, materials, devices, equipment, royalties and license fees, supervision, temporary facilities, construction equipment, bonds, insurance, taxes, clean up, traffic control, control surveys, field offices, close out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work in accordance with the Contract Documents.

E. Except for mobilization/demobilization and project record documents, payment for Work will be based on the percent of completed work of each item in the Schedule of Values, including stored materials, as determined by the County. Progress of work in each item of the Schedule of Values will be determined separately by the County. However, the County will issue a single payment certificate for progress on the Contract.

F. The Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise because of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts therefore.

G. Where payment by scale weight is specified under certain items, the Contractor shall provide suitable weighing equipment which shall be kept in accurate adjustment at all times and certified. The weighing of all material shall be performed by the Contractor in the presence and under the supervision of the County.

H. All schedules included in the Contract Documents are given for convenience and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quantity of materials and equipment included in work to be done under this Contract.

I. Where pipe fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve the Contractor from laying and jointing different or additional items where required.

1.03 CASH ALLOWANCES

A. The Contractor shall include in the Total Bid Amount, all cash allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by such persons as the County may direct.

B. The Contractor will obtain the County’s written acceptance before providing equipment, materials or other Work under a cash allowance. Payments under a cash allowance will be made based on actual costs, excluding costs of general conditions, handling, unloading, storage, installation, testing, etc, which will be considered to be included within the Contract Price. Payments within the limits of any Allowance will exclude overhead and profit and bond and insurance premiums, since those costs will be considered to be included within the Contract Amount. The Contractor shall submit appropriate documentation to validate the actual cost of the item.

C. The amount of the allowance shall be adjusted accordingly by Change Order to recognize the allowable cost incurred by the Contractor.

1.04 WORK NOT PAID FOR SEPARATELY

A. Delivery: Payment for equipment delivery, storage or freight shall be included in the pay items including their installation and no other separate payment will be made therefore.

B. Bonds: Payment for bonds required by the Contract shall be included in the pay items for the Work covered by the required bonds and no separate payment will be made.

C. Preparation of Site: Payment for preparation of site shall be included in pay items proposed for the various items of Work and no separate payment will be made therefore. Preparation of site includes setting up construction plant, offices, shops, storage areas, sanitary and other facilities required by the specifications or state law or regulations; providing access to the site; obtaining necessary permits and licenses; payments of fees; general protection, temporary heat and utilities including electrical power; providing shop and working drawings, certificates and schedules; providing required insurance; cleaning up; and all other work regardless of its nature which may not be specifically referred to in a Bid Item but is necessary for the complete construction of the project set forth by the Contract.

D. Permitting & Permit Fees.

E. The County reserves the right to delete any item included in the Schedule of Values and decrease the Contract Price by the scheduled amount for the item deleted.

1.05 MEASUREMENT FOR PAYMENT

A. Methods of Measurement - Generally:
   1. Units of measurement shall be defined in general terms as follows:
      a. Linear Feet (LF)
      b. Square Feet (SF)
      c. Square Yards (SY)
      d. Cubic Yards (CY)
      e. Each (EA)
      f. Sacks (SK)
      g. Lump Sum (LS)
   2. Unit Price Contracts/Items:
      a. Linear Feet (LF) shall be measured along the horizontal length of the centerline of the installed material, unless otherwise specified. Pipe shall be measured along the length of the completed pipeline, regardless of the type of joint required, without deduction for the length of valves or fittings. Pipe included within the limits of lump sum items will not be measured.

b. Square Feet (SF), Square Yards (SY), Cubic Yards (CY), Each (EA) and Sacks (SK) shall be measured as the amount of the unit of measure installed and compacted within the limits specified and shown in the Specifications and Drawings. Slope angles and elevations shall be measured using land-surveying equipment. Contractor shall provide supporting documentation (i.e. drawings, delivery tickets, invoices, survey calculations, etc.) to verify actual installed quantities.

B. Lump Sum Contracts/Items - Generally:
1. Quantities provided in the Schedule of Values are for the purpose of estimating the completion status for progress payments. Payment will be made for each individual item on a percentage of completion basis as estimated by the Contractor and approved by the County.
2. Adjustments to costs provided in the accepted Schedule of Values may be made only by Change Order.
3. The County reserves the right to delete any item included in the Schedule of Values and decrease the Contract Price by the scheduled amount for the item deleted.

1.06 MEASUREMENT AND PAYMENT ITEMS

A. ***Only those bid items included in the Bid Schedule are applicable for this Contract***. The County has standardized the measurement and payment items. Currently, there are approximately 100 measurement and payment items describing approximately 300 bid items. The bid item numbering system comprises five sections that are divided into 23 subsections. The sections and subsections are listed below.

10. General Requirements
    - 10.1 General
11. Site Work
    - 11.1 Miscellaneous
    - 11.2 Road Work
    - 11.3 Install/Replace Fence or Wall
    - 11.4 Bypass Pumping
    - 11.5 Abandon or Remove Pipe/Structure
12. Pressure Pipes
    - 12.1 Pressure Pipe and Fittings and Restrained Joints
    - 12.2 Valves
    - 12.3 Tapping Sleeve and Valve Assembly
    - 12.4 Cut-in Connections to Existing Main
    - 12.5 Piping Appurtenances
    - 12.6 Directional Drill
    - 12.7 Pipe Bursting

13. Wastewater Collection System
    - 13.1 Cleaning Sanitary Sewers
    - 13.2 CCTV Sanitary Sewers
    - 13.3 Install/Replace Sanitary Sewer
    - 13.4 Install/Replace Sanitary Manholes
    - 13.5 Sanitary Manhole Rehabilitation
    - 13.6 Sanitary Service Laterals and Cleanouts
    - 13.7 Cured-in-Place Pipe (CIPP) Liner
    - 13.8 Sanitary Sewer Pipe Bursting
14. Pump Stations
    - 14.1 Wastewater Duplex Pump Station
    - 14.2 Wastewater Triplex Pump Station

All of the subsections have bid item measurement and payment descriptions. Several bid items in the Project Bid Schedule may be described with the same bid item measurement and payment description in Table A, "Measurement and Payment Items". The bid items in the Project Bid Schedule are related to the Section 01025 measurement and payment items as follows:

1. All of the bid items in the Project Bid Schedule have 8 numerical digits.
2. Table A, “Measurement and Payment Items” for each of the bid items there are five numerical digits followed by “.xxx”.
3. The first 5 numerical digits of the bid item in the Project Bid Schedule designate the measurement and payment item found in Table A, "Measurement and Payment Items."

Table A

	14 PUMP STATION
	14.1 –Master Pump Station Wall Project
1.	**Reference ID 14.110.110 Master Pump Station (PS #3190 Orange Avenue)**
	a. Measurement: Measurement for this item shall be based on satisfactory construction of the new pump station precast concrete wall and gate including removal of the existing pump station chain link fence and gate and return in rolls to the Owner, remove and reinstall grounding rods from the existing fence, and maintaining security to the existing pump station; grading and drainage including installation of yard drains, drain pipes, bollards, erosion and sediment control, and sodding; new concrete driveway with backtracking provisions at the construction entrance; relocation and reinstallation of the existing odor control ductwork including relocation of the odor control fan, fan pad extension, start-up and testing, relocation of the pipe supports, new pipe support base, and installation of the Mist and Grease Elimination System; complete and ready for continuous operation as shown on the Drawings and specified herein. b. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to construct the new pump station precast concrete wall and gate, remove and reinstall grounding rods from the existing fence,, grading and drainage, new concrete driveway with backtracking provisions at the construction entrance; relocation and reinstallation of the existing odor control ductwork as indicated on the Drawings. Work includes but is not necessarily limited to the following: pump station improvements including precast concrete wall, grading and drainage, sodding, concrete driveway, relocation of the odor control ductwork and fan and appurtenances as shown on the Drawings. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. Measurement for various items covered under General Requirements, will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.

	Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on the Contract, including, but not limited to, movement of those personnel, equipment, supplied and incidentals to the project site, preparation of submittals, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount. Payment for Project Record Documents (Section 01720) shall be based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount. Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor $20.00 and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.

1 **END OF SECTION**

SECTION 01027
APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENT

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

B. Prior to submitting a monthly payment application, the Contractor's progressive As-Built Drawings and As-Built Asset Attribute Data, shall be accepted by the County.

C. Progressive As-Built Drawings shall indicate the horizontal and vertical locations of all current constructed improvements with sufficient information and notes to easily determine if the improvements were constructed in conformance with the Contract Documents. The progressive As-Built Asset Attribute Data, shall include a Surveyor's certified statement regarding the constructed improvements being within the specified accuracies or if not, indicating the variances as described in specification Section 01050 "Surveying and Field Engineering", Table 01050-1 Minimum Survey Accuracies.

1.02 FORMAT

A. Format and Content: Use the accepted Schedule of Values.

1. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

a. Generic name
b. Related Specification Section
c. Name of Subcontractor
d. Name of manufacturer or fabricator
e. Name of supplier
f. Dollar value

2. Round amounts off to the nearest whole dollar. The total shall equal the Contract Amount.

1.03 PREPARATION OF APPLICATION

A. Each Application for Payment shall be consistent with previous applications and payments as certified and paid for by the County.

1. The initial Application for Payment: The Application for Payment at time of Substantial Completion and the final Application for Payment involve additional requirements.

B. Payment Application Times: As stated in the General Conditions, Payment applications are to be submitted monthly on a day of the month to be established by the County at the Pre-Construction conference.

C. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Contractor. Incomplete applications will be returned without action.

1. Submit applications typed on forms provided by the County.

2. Use data on Bid Form and approved Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.

3. List each authorized Change Order and an extension or continuation sheet, listing Change Order number and dollar amount as for an original item of work.

4. Each item shall have an assigned dollar value for the current pay period and a cumulative value for the project to-date.

5. Submit stored material log, partial waivers of claims and mechanic liens, and consent of surety with each application, as further explained below.

D. Submit a stored material log with each application for payment which identifies the type, quantity and value of all stored material, and that tracks when the stored materials are installed and deducts them from stored quantity at that time. Include original invoices for all stored materials that payment is requested.

E. Waivers of Claims and Mechanics Lien: With each Application for Payment submit waivers of claims and mechanics liens from Subcontractors or Sub-subcontractors and suppliers for the construction period covered by the previous applications.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.

2. When an application shows completion of an item, submit final or full waivers.

3. The County reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceeded by final waivers from every entity involved with performance of work covered by the application that could lawfully be entitled to a payment claim or lien.

5. Waiver Forms: Submit waivers of claims and lien on forms and executed in a manner acceptable to the County.

F. Transmittal: Submit four (4) executed copies of each Application for Payment to the County by means ensuring receipt within 24-hours. One (1) copy shall be complete, including waivers of lien and similar attachments when required.

1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the County.

2. The Contractor shall include a certification with each application stating that all previous payments received from the County under the Contract have been applied by the Contractor to discharge in full all obligations of the Contractor in connection with the Work by prior applications for payment, and all materials and equipment incorporated into the Work are free and clear of all liens, claims, security interest and encumbrances.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:

1. List of Subcontractors

2. List of principal suppliers and fabricators

3. Schedule of Values

4. Contractor's Construction Progress Schedule (accepted)

5. List of Contractor's staff assignments

6. Copies of building permits

7. Copies of authorizations and licenses from governing authorities for performance of the Work

8. Certificates of insurance and insurance polices

9. Performance and Payment bonds (if required)

10. Data needed to acquire County's insurance

H. Monthly Application for Partial Payment: Administrative actions and submittals that must precede or coincide with submittal of Monthly Partial Payments include the following:

1. Relevant tests

2. Progressive As-builts (one (1) paper copy and electronic copy)

3. Table 01050-2 Asset Attribute Data Form Examples (one (1) paper copy and electronic copy)

4. An electronic copy of all survey field notes
5. Partial Release of lien
6. Partial consent of surety
7. Site photographs
8. Updated Progress Schedule: submit one (1) electronic copy and five (5) copies
9. Summary of Values
10. Pay Request
11. On-Site Storage

I. Substantial Completion Application for Payment: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment. This application shall reflect any Certificates of Partial Substantial Completion issued previously for County occupancy of designated portions of the Work.

1. Administrative actions and submittals that shall precede or coincide with this application include:

a. Occupancy permits and similar approvals
b. Warranties (guarantees) and maintenance agreements
c. Test/adjust/balance records
d. Maintenance instructions
e. Start-up performance reports
f. Change-over information related to the County's occupancy, use, operation and maintenance
g. Final Cleaning
h. Application for reduction of retainage and consent of surety
i. Advice on shifting insurance coverage
j. List of incomplete Work, recognized as exceptions to County’s Certificate of Substantial Completion

J. Final Completion Application for Payment: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:

1. Prior to submitting a request for final payment or the County issuing a Certificate of Completion for the Work, the Contractor shall submit the final Record Documents to the County for approval. Retainage funds will be withheld at the County’s discretion based on the quality and accuracy of the final Record Documents.
2. Completion of project close-out requirements
3. Completion of items specified for completion after Substantial Completion
4. Assurance that unsettled claims are settled

5. Assurance that work not complete and accepted is now completed
6. Transmittal of required project construction records to the County
7. Proof those taxes, fees and similar obligations have been paid
8. Removal of temporary facilities and services has been completed.
9. Removal of surplus materials, rubbish and similar elements
10. Change of door locks to County's access
11. Execute certification by signature of authorized officer.
12. Prepare Application for Final Payment as required in General Conditions.

1.04 SUBMITTAL PROCEDURES

A. Submit four (4) copies of each Application for Payment at time stipulated in Agreement.

B. Submit under transmittal letter.

1.05 SUBSTANTIATING DATA

A. When the County requires substantiating information, submit data justifying line item amounts in question.

B. Provide one (1) copy of data with cover letter for each copy of submittal. Show Application number and date, and line item by number and description.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01050
SURVEYING AND FIELD ENGINEERING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Professional Surveyor: Provide professional surveying and mapping work required for the execution of the contract, including verification of existing survey data, construction layout, and production of the As-Built Drawings. This Work shall be performed by a Surveyor that is licensed by the State of Florida as a Professional Surveyor and Mapper pursuant to Chapter 472, F.S.

B. Professional Engineer: The Contractor shall provide the services of a Registered Professional Engineer currently licensed in the State of Florida for the following specific services as applicable to the Work.

1.02 REQUIREMENTS

A. Survey Services

1. The Contractor shall retain the services of a registered Surveyor and Mapper licensed in the State of Florida to provide professional surveying and mapping services, and maintain both a control survey and an as-built survey during construction. The Surveyor will identify control points (monuments and benchmarks noted on the Drawings). The construction layout survey shall be established from the control points shown on the Construction Drawings and confirmed. The method of field staking for the construction of the Work shall be at the option of Contractor. The accuracy of any method of staking shall be the responsibility of Surveyor. All staking shall be done to provide for easy verification of the Work by the County. The Contractor shall provide all surveys necessary for the construction of the Work.

B. Engineering Services

1. The Engineer shall be responsible for duties during Construction to include, but not limited to:

   a. Inspections, testing, witnessing requiring a licensed Professional Engineer.
   b. Design of temporary shoring, bridging, scaffolding or other temporary construction, formwork and protection of existing structures.
   c. Other requirements as specified herein.

2. Engineering related designs, tests and inspections shall be signed by the licensed Professional Engineer as required by the County.

1.03 QUALIFICATIONS OF THE SURVEYOR

A. The Surveyor, who is proposed by the Contractor to provide services for the Project, is subject to the approval of the County. Prior to any services being performed, the Contractor shall submit the name and address of any proposed Surveyor and a written acknowledgement from the Surveyor stating that he has the hardware, software and adequate scope of services in his agreement with the Contractor to fully comply with the requirements of this specification. These submittals shall be provided to the County prior to Notice to Proceed. It is recommended that the Surveyor attend the Pre-Construction meeting. Any Surveyor, who has not previously performed work for the County shall attend the Pre-Construction meeting.

1.04 SUBMITTALS

A. Provide qualifications of the Surveyor or Engineer.

1. A Florida Registered Professional Engineer or Registered Surveyor and Mapper, who is proposed by the Contractor to provide services for the Work, shall be acceptable to the County prior to field services being performed.

2. A Professional Engineer shall be of the discipline required for the specific service for the Work.

3. Submit name, address and telephone number of the Surveyor and/or Engineer, as appropriate to the County for acceptance before starting survey or engineering work.

B. On request, submit documentation verifying accuracy of survey work.

C. Surveyor shall certify all elevations and locations included in Table 01050- 2, 3, and 4.

PART 2 - PRODUCTS

2.01 SURVEY DOCUMENTS

A. Survey documents shall comply with the Minimum Technical Standards of Chapter 5J-17 of the Florida Administrative Code (FAC) and Table 01050-1 Minimum Survey Accuracies, whichever are more stringent. All coordinates shall be geographically registered in the Florida State Plan Coordinate System using the contract Drawings control points for horizontal and vertical controls.

B. The Surveyor shall not copyright any of their Work related to this project.

Table 01050-1
Minimum Survey Accuracies

Asset	Horizontal Accuracy (feet)	Elevation Accuracy (feet)	Location: Horizontal Center and Vertical Top, unless otherwise specified
Bench Marks	0.01	0.01	Point
Baseline Control Locational Accuracy	0.01	N/A	Point
Tract and Easement Corners	*	N/A	Survey Monuments
Mains at 100-feet maximum intervals	0.1	0.1	Pipe, Pipe at Valves, Pipe at Bore & Jack Casing
PVC pipe >16-inch at every pipe joint	0.1	0.1	Pipe, Pipe at Valves, Pipe at Bore & Jack Casing
Fittings, Sleeve, Tapping Saddle, and end of the pipe if Plugged or Capped.	0.1	0.1	Fitting
Restrained Pipe	0.1	N/A	Restrained Joint Limits
Connections	0.1	0.1	Pipe
Bore & Jack Casing	0.1	0.1	Top of Casing at the Casing Limits
Directional Drill	0.1	0.1	10-foot intervals during the directional drill operation
Hydrants	0.1	N/A	Operating Nut of Hydrant
Valves	0.1	0.1	Operating Nut
Air Release, Blow off, and Backflow Valves	0.1	N/A	Valve Enclosure
Master Meters, Deduct Meters & Wastewater Meters	0.1	N/A	Register
Meter Box	0.1	N/A	Meter Box
Clean out	0.1	N/A	Clean out
Manhole Rim	0.1	0.1	Manhole
Manhole Inverts	N/A	0.01	Pipe Inverts
Pump Station (Public & Private)	0.1	0.01	Wetwell and Pipe Inverts
Production Well or Monitoring Well	0.1	0.1	Well
Grease Interceptor	0.1	0.1	
Oil / Water Separators	0.1	0.1	
Demolished Pipe (abandoned in place or removed)	0.1	0.1	Limits of Abandoned or Removed Pipe
Existing Utilities water, wastewater, reclaimed water, and appurtenant structures **	0.1	0.1	Pipe or Structure

* Shall conform to the requirements of the "Chapter 5J-17, 'Minimum Technical Standards', FAC", certified by a SURVEYOR.

** Existing utilities including but not limited to water, wastewater, reclaimed water, stormwater, fiber optic cable, electric, gas and structures within the limits of construction.

TABLE 01050-2
Asset Attribute Data Form Examples

Fitting Worksheet

Microsoft Excel - Example ContractorUploadSheet 2010-0326.xls

	A	C	D	E	F	G	H	I
1	ID Number	Plan Sheet #	Easting	Northing	Elevation	Main Type	Fitting Type	Comments
2	FM-1	C-3	572399.28	1539339.13	46.27	Force Main	Bend 11 1/4°	
3	FM-2	C-3	574840.74	1539856.91	51.73	Force Main	Bend 22-1/2°	
4	FM-3	C-3	574844.01	1539856.71	52.48	Force Main	Bend 45°	
5	FM-4	C-3	574845.72	1539856.61	52.33	Water Main	Bend 90°	
6	FM-5	C-3	574845.85	1539858.77	51.98	Water Main	Cap	
7	RW-1	C-4	574884.06	1539849.64	51.75	Reclaimed Water Mai	Cross	
8	RW-2	C-4	574887.22	1539849.56	48.98	Reclaimed Water Mai	Reducer	
9	RW-3	C-4	574904.30	1539849.10	49.39	Reclaimed Water Mai	Plug	
10	RW-4	C-4	574907.42	1539849.01	52.32	Reclaimed Water Mai	Sleeve	
11	WM-1	C-5	574938.65	1539848.16	54.42	Water Main	Tapping Saddle	
12	WM-2	C-5	572532.38	1539337.10	45.27	Water Main	Tee	
13	WM-3	C-5	572631.00	1539338.00	44.13	Water Main	Wye	
14	WM-4	C-5	572731.00	1539334.00	43.77	Water Main	Tapping Sleeve	

General Info / Hydrant / Valve / Manhole / Meter / **Fitting** / Cleanout / Pipe / Pum

Pipes Worksheet

Microsoft Excel - Example ContractorUploadSheet 2010-0326.xls

	A	C	D	E	F	G	H	I	J	K	L
1	ID Number	Plan Sheet #	Easting	Northing	Elevation	Main Type	Type of Shot	nstruction Meth	Material	Pressure Class	Manufacturer
2	CSNG-1	C-4	517827.57	1482195.46	78.83	Force Main	Bore & Jack (Casing)		PVC	DR18	Brand A
3	CSNG-2	C-4	517848.20	1482195.31	78.38	Force Main	Bore & Jack (Casing)		PVC	DR18	Brand A
4	RW-1	C-7	517731.98	1482237.24	80.42	Reclaimed Water Main	Restraint Joint Limit	Open Cut	DIP	Class 250	Brand B
5	RW-2	C-7	517732.848	1482338.1	80.943	Reclaimed Water Main	Restraint Joint Limit	Open Cut	DIP	Class 250	Brand B
6	WM-1	C-9	573309.068	1539372.9	56.10	Water main	Shot on Pipe	Open Cut	PVC	DR18	Brand C
7	WM-2	C-9	573308.752	1539375	54.66	Water main	Shot on Pipe	Open Cut	PVC	DR18	Brand C
8	FMDD-1	C-4	504345.94	1488969.2	114.14	Force Main	Shot on Pipe	Directional Drill	HDPE	DR17	Brand X
9	FMDD-2	C-4	504360.86	1488970.5	112.74	Force Main	Shot on Pipe	Directional Drill	HDPE	DR17	Brand X
10	FMDD-3	C-4	504377.19	1488971.2	106.14	Force Main	Shot on Pipe	Directional Drill	HDPE	DR17	Brand X
11	FM-9	C-4	504480.47	1488982.9	105.24	Force Main	Shot on Pipe	Open Cut	PVC	DR18	Brand C

General Info / Hydrant / Valve / Manhole / Meter / Fitting / Cleanout / **Pipe** / Pumpstation / We

Easements Worksheet

Microsoft Excel - Example ContractorUploadSheet 2010-0326.xls

A2 Corner-1

	A	C	D	E	F	G	H
1	ID Number	Plan Sheet #	Easting	Northing	Elevation	Boundary Corner Type	Comments
2	Corner-1	C-8	463484.59	1511029.72		Pump Station Tract	N.W. CORNER
3	Corner-2	C-8	463523.24	1511040.01		Pump Station Tract	N.E. CORNER
4	Corner-3	C-8	463480.45	1511015.23		Pump Station Tract	S.W. CORNER
5	Corner-4	C-8	463526.97	1511025.49		Pump Station Tract	S.E. CORNER
6						Easement	
7						Property	

Pipe | Pumpstation | Well | Property or Easement Corner | Existing OC Ul

Draw | AutoShapes

Ready NUM

Existing OC Utility Crossing

Microsoft Excel - Example ContractorUploadSheet 2010-0326.xls

	A	C	D	E	F	G	H	I
1	ID Number	Plan Sheet #	Easting	Northing	Existing Pipe Elevation	Proposed Crossing Elevation	Existing Main Type	Comments
3	Confl-1	C-750	463464.47	1511013.75	100.54	104.88	Water main	
4	Confl-2	C-750	463163.91	1510693.49	98.32	103.57	Storm Main	

Pipe | Pumpstation | Well | Property or Easement Corner | Existing OC Utility Crossing | Grease Interceptor

Draw | AutoShapes

Grease Interceptor

Microsoft Excel - Example ContractorUploadSheet 2010-0326.xls

	A	C	D	E	F	G	H
1	ID Number	Plan Sheet #	Easting	Northing	Elevation	Volume (Gallons)	Comments
2	GI-1	C-400	508387.3	1487203.18	89.70	1000.00	

Pumpstation | Well | Property or Easement Corner | Existing OC U

Draw | AutoShapes

PART 3 - EXECUTION

3.01 SURVEY FIELD WORK

A. Locate, reference, and preserve existing horizontal and vertical control points and property corners shown on the Drawings prior to starting any construction work. If the Surveyor performing the Work discovers any discrepancies that will affect the Project, the Contractor must immediately report these findings to the County. All survey work shall meet the requirements as defined in Florida Administrative Code 5J-17. Reference and preserve all survey points during Construction. If survey points

are disturbed, it is the responsibility of the Contractor's Surveyor to reset the points at the Contractor's expense. Copies of the Surveyor's field notes and/or electronic files for point replacement shall be provided to the County.

1. The Surveyor shall locate all improvements for the project As-Built Asset Attribute Data using State Plane Coordinates as the horizontal datum and the benchmark referenced on the Drawings as the vertical datum. The County will provide electronic files of the Drawings to be used by the Surveyor in complying with these specifications.

2. The construction layout shall be established from the reference points shown or listed on the Drawings. The accuracy of any method of staking shall be the responsibility of the Contractor. All construction layout staking shall be done such as to provide for easy verification of the Work by the County.

B. Only a Surveyor licensed in the State of Florida shall be employed for this Work. All control points shall be protected by the Contractor from disturbance. If the monuments are disturbed, any Work that is governed by these monuments shall be held in abeyance until the monuments are reestablished by the Contractor and approved by the County. The accuracy of all the Contractor's stakes, alignments and grades is the responsibility of the Contractor. However, the County has the discretionary right to check the Contractor's stakes, alignments, and grades at any time.

C. Use survey control points to layout such work tasks including but not limited to:

1. Clearing, grubbing, work limits, right-of-way lines and easements

2. Locations for pipelines and all associated structures and appurtenances

D. The Surveyor shall reference and replace any project control points, boundary corners, benchmarks, section corners, and right-of-way monuments that may be lost or destroyed, at no additional cost to the County. Establish replacement points based on the original survey control. Copies of all reference field notes and/or electronic files for point replacement shall be submitted to the County.

3.02 SURVEYING

A. Locate and protect existing horizontal and vertical control points shown on the construction Drawings prior to starting any work. If the Surveyor performing the Work finds differences that will effect the Work, the Contractor must immediately report the findings to the County. Establish control points, lines and levels by instrumentation and similar appropriate means. The location of these points should minimize the number of sightings necessary to control the Work and the likelihood of the points being disturbed. Preserve and reference all permanent reference points during Construction. If permanent reference points are disturbed, it is the responsibility of the Contractor's Surveyor to reset the points at the Contractor's expense. Copies of the Surveyor's field notes shall be provided to the County.

1. Record locations, with horizontal and vertical data, on project As-Built survey.

2. Make no changes or relocations without prior written notice to the County or without receipt of written approval from the County.

3. Report to the County when any control point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

B. Cover for drains shall vary to provide long uniform gradient or slope to pipe to minimize air pockets.

3.03 SURVEY DOCUMENTS

A. The Tables 01050-2 Asset Attribute Data, shall be signed, sealed and dated by the Surveyor with each pay request as specified in Section 01027 "Application for Payment" and the requirements of Section 01720 "Project Record Documents."

END OF SECTION

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SECTION 01065
PERMITS AND FEES

PART 1 - GENERAL

1.01 REQUIREMENTS

A. General

1. Upon Notice of Award, obtain and pay for all appropriate and applicable permits and licenses as provided for in the General Conditions, except as otherwise provided herein.

2. Schedule all inspections and obtain all written approvals of the agencies required by the permits and licenses.

3. Strictly adhere to the specific requirements of the governmental unit(s) or agency(cies) having jurisdiction over the Work. Whenever there is a difference in the requirements of a jurisdictional body and the Contract Documents, the more stringent shall apply.

4. A copy of the permits obtained by the County are furnished in Appendix C "Permits Obtained by County" of these specifications.

5. Unless otherwise specified, the cost of work specified in the various sections of Division 1, will not be paid for separately but the cost therefore shall be considered incidental to and included in the bid prices of the various Contract items.

B. Building Permit (Orange County)

1. The County will pay the general building permit fee and any related impact fees or assessments to be paid to Orange County for the issuance of that permit only.

2. The Contractor shall pay all fees associated with obtaining Orange County trade permits and any and all inspection fees for the Orange County Building Department providing inspections for this project. The Contractor shall apply for and obtain the building permits from Orange County and schedule and obtain final approval from the building inspectors.

3. Information on Orange County Building Department fees is included in the Instructions to Bidders in Division 0.

4. The Contractor shall be responsible for scheduling all permit inspections and obtaining inspection approval from Orange County, as required by the building and sub-discipline construction permits.

C. Construction Dewatering Permit

The Contractor shall apply and pay for all fees associated with obtaining Florida Department of Environmental Protection District Office construction dewatering permits, if required. The Contractor shall provide all materials and equipment to comply with the permit requirements at no additional cost to the County.

D. Sunrail CFRC General Use Permit

1. The Contractor shall coordinate and apply for General Use Permit and provide information outlined in the CFRC Right of Entry Application Additional Information, refer to Appendix F for details.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01070
ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Reference to the following standards of any technical society, organization or body shall be construed to mean the latest standard, code or specification or tentative specification adopted and published at the date of advertisement for bids, even though reference has been made to an earlier standard. Such reference is hereby made a part of the Contract the same as if herein repeated in full and in the event of any conflict between any of these specifications, standard codes or tentative specifications and the Contract Documents, the most stringent shall govern.

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturer's Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	American Moving and Conditioning Association
ANSI	American National Standards Institute
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	American Standards Association (now ANSI)
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSCBC	American Standard Safety Code for Building Construction
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWBP	American Wood Preservers Board
AWS	American Welding Society
AWWA	American Water Works Association

CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
DOT Spec	Standard Specification for Road and Bridge Construction –
FDOT	Florida Department of Transportation
FAC	Florida Administrative Code
FS	Federal Standard
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
NACE	National Association of Corrosion Engineers
NASSCO	National Association of Sewer Service Companies
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NEC	National Electrical Code
NECA	National Electrical Contractor's Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPT	National Pipe Threads
NSF	National Science Foundation
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PS	United States Products Standards
SAE	Society of Automotive Engineers
SDI	Steel Decks Institute
SJI	Steel Joists Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Structural Steel Painting Council
UL	Underwriter's Laboratories, Inc.
USASI	United States of American Standards Institute (Now ANSI)

1 B. UNITS OF MEASUREMENT

2

CU FT	cubic feet
CU IN	cubic inch(es)
CY	cubic yard(s)
DegC	degree(s) Centigrade
DegF	degree(s) Fahrenheit
F	Fahrenheit
FT	feet, foot
G	gram(s)
GA	gage
GAL	gallon(s)
GPH	gallon(s) per hour
GPM	gallon(s) per minute

GPS	gallon(s) per second
HR	hour(s)
IN	inch(es)
IPS	iron pipe size
KG	kilogram(s)
L	liter(s)
LB	pound(s)
LBF-IN	pound (force) inch
LF	linear foot, linear feet
MIN. min.	minute(s), minimum
ml	milliliter
MO	month(s)
OZ	ounce(s)
QT	quart
RH	relative humidity
SF	square foot, square feet
SQ IN	square inch(es)
YD	yard(s)
YR	year(s)

1 C. TERMINOLOGY

@	at
AB	anchor bolt
ADJ	adjust, adjustable
ADMIN	administration
AFG	above finished grade
AGGR	aggregate
AL	aluminum
ALT	alternate
APPX	appendix
APX	approximate
ART	article
ASPH	asphalt
ASSY	assembly
AUTO	automatic
AUX	auxiliary
AVE	avenue
AVG	average
AWG	American Wire Gauge
BAR	barrier
BCCMP	bituminous coated corrugated metal pipe
BL	base line
BLDG	building
BLKG	blocking
BM	beam

C to C	center to center
CCB	concrete block, masonry
CEM	cement
CIP	cast iron pipe, cast in place
CJ	construction joint
CL	center line, clearance
CM	Construction Manager
CMP	corrugated metal pipe
CO	cleanout
CONC	concrete
CONN	connection
CONST	construction
CONT	continuous
CONTR	contractor
CU, COP	copper
ORR	corridor
CRIT	critical
CTD	coated
CTR	center
CULV	culvert
d	delta
DBL	double
DEM	demolition, demolish
DEPT	department
DET	detail
DIA, D	diameter
DIAG	diagonal
DIM	dimension
DWG	drawing
FEM	female
FUT	future
FV	field verify
FM	force main
FH, HYD	fire hydrant
ID	inside diameter
MAS	masonry
MATL	material
MAX	maximum
MFD	manufactured
MFG	manufacturing
MFR	manufacturer
MH	manhole, metal hallide
MIN	minimum
MISC	miscellaneous
MTL	material

NAT	natural
NATL	national
NOM	nominal
NTS	not to scale
OD	outside diameter
PP	power pole
R	radius
Rd	road
REIN	reinforce
REL A	relief air
REQD	required
REV	revision
RR	railroad
R/W	right-of-way
RWM	reclaimed water main
RY	railway
SAN	sanitary
SCH	schedule
SECT	section
SLV	sleeve
SQ	square
SST	stainless steel
ST	street
STA	station
STD	standard
SURF	surface
SUSP	suspend(ed)
SYM	Symbol, symmetrical
SYS	system
TEMP	Temperature, temporary
TYP	typical
UTIL	utility
W	West
WLD	welded
WM	water main
W/O	without
WT	weight
YD	yard
YR	year
Y W	wye

1 **END OF SECTION**

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SECTION 01091
REFERENCE SPECIFICATIONS

PART 1 - GENERAL

1.01 GENERAL

A. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of or omission from said standards or requirements.

B. Assignment of Specialists: In certain instances, specification test requires (or implies) that specific work is to be assigned to specialist or expert entities who must be engaged for the performance of the Work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work. They are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all Work specified herein shall conform to or exceed the requirements of such referenced documents which are not in conflict with the requirements of these Specifications or applicable codes.

B. References herein to "Building Code" shall mean the Florida Building Code. The latest edition of the code shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, Drawings, and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.

D. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor participation in pre-construction conferences, progress meetings and specially called meetings.

1.02 MEETINGS CALLED BY THE COUNTY

A. The County will schedule and administer a pre-construction conference, periodic progress meetings and specific topic meetings throughout the progress of the Work. The County will:

1. Prepare and distribute a notification of the meeting to required attendees.
2. Establish, prepare and distribute an agenda with the notification.
3. Make physical arrangements for the meetings.
4. Preside at meetings.
5. Prepare and distribute minutes of meetings including significant proceedings and decisions, within 15 working days after each meeting. Minutes will be forwarded to all participants and to parties affected by decisions made at the meeting.

B. Representatives of the Contractor, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. The meeting location will generally be a central site, convenient for all parties, designated by the County.

1.03 PRE-CONSTRUCTION CONFERENCE

A. Attendance:

1. County
2. Contractor and superintendent
3. Subcontractors as appropriate to the agenda
4. Representatives of suppliers and manufacturers as appropriate to the agenda
5. County MBE/WBE representative
6. Other agency representatives (FDEP, EPA, City, etc.)

7. Others as requested by the County or Contractor

B. Suggested Agenda:

1. Distribution and discussion of:

   a. List of major Subcontractors and suppliers
   b. Construction schedules
   c. Contact information

2. Organizational arrangement of Contractor's forces and personnel, and those of Subcontractors, material and equipment suppliers, and the County

3. Critical work sequencing

4. Major equipment deliveries

5. Project coordination

   a. Designation of responsible personnel
   b. Channels and procedures for communication

6. Procedures and processing of:

   a. Field decisions
   b. Proposal requests
   c. Submittals
   d. Change orders
   e. Applications for payment/Schedule of Values
   f. Contractor quality control
   g. Submittal of Shop Drawings, project data and samples

7. Adequacy of distribution of Contract Documents

8. Procedures for maintaining as built and record documents

9. Use of premises:

   a. Office, work and storage areas
   b. County's requirements
   c. Housekeeping

10. Temporary construction facilities

11. Temporary utilities

12. Safety and first aid procedures

13. Rules and regulations

14. Security procedures

15. Place, date and time for regular progress meetings

16. Completion time for Contract and liquidated damages

1.04 PROGRESS MEETINGS

A. The County will schedule progress meetings every month and as required by progress of the Work with the first meeting (one) 1-month after the pre-construction meeting. The Contractor will prepare and distribute the meeting minutes within 7 calendar days.

B. Attendance:

1. County
2. Contractor
3. Subcontractors as appropriate to the agenda
4. Suppliers as appropriate to the agenda
5. Others as appropriate

C. The Contractor's representative is to attend the project meetings and have the authority to act on behalf of the entity represented on field related matters. Contractor’s representative is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics and provide specific information including but not limited to:

1. Status of submittals and actions necessary to expedite them
2. Status of activities behind schedule and actions necessary to regain the approved schedule
3. Status of materials and equipment deliveries and action necessary to expedite materials and equipment and maintain the approved schedule
4. Status of open RFI’s and actions necessary to address them

D. To the maximum extent practicable, the Contractor is to assign the same personnel to represent the Contractor at Progress Meetings throughout the progress of the Work.

E. The Contractor is to provide a current Shop Drawing submittal log at each progress meeting.

F. The Contractor is to provide copies of the updated Progress Schedule at each project meeting in accordance with the General Conditions.

G. Suggested Agenda:

1. Review and approve minutes from previous meeting
2. Review of Work progress since previous meeting to include current As-Builts
3. Contractor’s/Subcontractor’s workforce and equipment
4. Progressive As-Built Drawings

5. Surveyor’s submittals

   a. As-Built Asset Attribute Data Table (see Table 01050-2)
   b. Pipe Deflection Table (see Table 01050-3)
   c. Gravity Main Table (see Table 01050-4)

6. Field observations, problems and conflicts

7. Construction progress and problems which impede construction schedule

8. Shop Drawing submittal status

9. Requests for Information (RFI) status

10. Change order status

11. Review of off site fabrication and delivery schedules

12. Corrective measures and procedures to regain approved schedule

13. Revisions to construction schedule

14. Job progress and schedule for succeeding work period

15. Coordination of schedules

16. Maintenance of quality standards

17. Review submittal schedule; expedite as required

18. Pending requests for information, changes and substitutions

19. Review proposed changes for effect on construction schedule and completion date

20. Pay application status

21. Other business

H. Revision to Minutes:

1. Unless minutes are challenged, in writing, prior to the next regularly scheduled Progress Meeting, they will be accepted as properly summarizing the discussions and decisions of the meeting.

2. Persons challenging minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.

3. Challenge to minutes shall be settled as priority portion of "old business" at next regularly scheduled meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01300
SUBMITTALS

PART 1 - GENERAL

Work completed without approved Shop Drawings and/or samples shall be considered installed at the Contractor's risk.

1.01 SHOP DRAWINGS AND DATA

A. Shop Drawings defined in the General Conditions, shall complement design and construction Drawings, and shall contain sufficient detail to clearly define all aspects of the Construction. These Drawings shall be complete and detailed.

B. Contractor and Supplier's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be clearly marked with specification title and numbers to identify pertinent materials, product or models. Delete information which is not applicable to the Work by striking or cross-hatching.

C. If Shop Drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in the letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, the Contractor shall not be relieved of the responsibility for executing the Work in accordance with the Contract, even though such Drawings have been reviewed.

D. Data on materials and equipment shall include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, verification of conformance with applicable standards or codes, materials of construction and similar descriptive material. Materials and equipment list shall, for each item, give the name and location of the Supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

E. For all equipment furnished, the Contractor shall provide a list including the equipment name and address and telephone number of the Supplier's representative and service company so that service and/or spare parts can be readily obtained.

F. The Contractor will obtain an installation list from suppliers and equipment suppliers who propose to furnish equipment or products for submittal to County/Professional along with the required Shop Drawings. The installation list shall include at least 5 installations where identical equipment has been installed and has been in operation for a period of at least 1-year.

1.02 REVIEW OF SHOP DRAWINGS AND SAMPLES

A. The County /Professional's review of Shop Drawings, Data, and Samples as submitted by the Contractor will be to determine if the items(s) generally conform(s) to the information in the Contract Documents and is/are compatible with the design concept. The County/Professional's review and exceptions, if any, will not constitute an approval of dimensions, connections, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:

1. As permitting any departure from the Contract Documents

2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials

3. As approving departures from details furnished by the County/Professional, except as otherwise provided herein

C. If the drawings or schedules as submitted describe variations and show a departure from the Contract Documents which the County/Professional finds to be in the interest of the County and to be so minor as not to involve a change in Contract Price or Contract Time, the County/Professional may return the reviewed drawings without noting an exception.

D. "Approved As Noted": Contractor shall incorporate County/Professional's comments into the submittal before release to manufacturer. The Contractor shall send a letter to the County/Professional acknowledging the comments and their incorporation into the Shop Drawing.

E. "Amend and Resubmit": Contractor shall resubmit the Shop Drawing to the County/Professional. The resubmittal shall incorporate the County/Professional's comments highlighted on the Shop Drawing.

F. "Rejected": Contractor shall correct, revise and resubmit Shop Drawing for review by County/Professional.

G. Resubmittals will be handled in the same manner as first submittals. For resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by County/Professional on previous submissions. The Contractor shall make any corrections required by the County/Professional.

H. If the Contractor considers any correction indicated on the Drawings to constitute a change to the Drawings or Specifications, the Contractor shall give written notice thereof to the County/Professional.

I. When the Shop Drawings have been completed to the satisfaction of the County/Professional, the Contractor shall carry out the Construction in accordance

therewith and shall make no further changes therein except upon written instructions from the County/Professional.

J. No partial submittals will be reviewed. Submittals not deemed complete will be stamped "Rejected" and returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the County/Professional, make all submittals in groups containing all associated items for:

1. Systems
2. Processes
3. As indicated in specific Specifications Sections
4. All drawings, 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 interfaces checking.

K. Only the County/Professional shall utilize the color "red" in marking Shop Drawing submittals.

L. Failure to comply with any of the above may result in the rejection of Shop Drawings.

1.03 PRODUCT DATA

A. Submit not less than 6-copies, unless approved by the County/Professional. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to the Work.

1.04 MANUFACTURERS' INSTRUCTIONS

A. When required in an individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing, in quantities specified for product data.

1.05 SAMPLES

A. Submit full range of manufacturers' standard colors, textures and patterns for the County's selection. Submit samples for selection of finishes within 30-days after Award of Contract. All color and finish selections must be submitted by the Contractor in a single submission, properly labeled and identified.

B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

C. Submit the number of samples specified in the respective Specification section, but no less than two (2). After review one (1) will be retained by the County. Reviewed samples that may be used in the Work are indicated in the Specification Section.

D. Samples shall be delivered to the County as directed. The Contractor shall prepay shipping charges on samples. Materials or equipment for which samples are required shall not be used in the Work until approved by the County/Professional.

E. Samples shall be of sufficient size 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. Each sample shall have a label indicating:

a. Name of Project
b. Name of Contractor and Subcontractor
c. Material or equipment represented
d. Place of origin
e. Name of product and brand (if any)
f. Location in Project
g. Specification title and number
h. Submittal number
i. Note: Samples of finished materials shall have additional marking that will identify them under the finished schedules.

F. The Contractor shall prepare a transmittal letter, in triplicate (3) for each shipment of samples containing the information required in paragraph herein. The Contractor shall enclose a copy of this letter with the shipment and send a copy of this letter to the County/Professional. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

G. Approved samples not destroyed in testing shall be sent to the County or stored at the site of the Work. Approved samples of the hardware in good condition may be incorporated in the Work if requested in writing by the Contractor and approved in writing by the County/Professional. Samples that failed testing or were not approved will be returned to the Contractor at the Contractor's expense, if so requested at time of submission.

1.06 FIELD SAMPLES

A. Provide field samples of finishes as required by individual Specifications sections. Install the sample completely and finished. Acceptable samples in place may be retained in completed Work.

1.07 DRAWINGS, PRODUCT DATA AND CERTIFICATES

A. Each letter of transmittal shall identify each and every item transmitted by title, drawing number, revision number and date.

B. The County generally will not check dimensions, quantities or schedules, except in cases where the information is lacking in the Specifications.

C. The following is applicable to submitted drawings, data and certificates:

1. Show relation to adjacent structures or materials.

2. Clearly identify field dimensions.

3. Show required dimensions and clearances.

4. Performance characteristic and capabilities shall accompany original Shop Drawing submittals.

5. Wiring diagrams and controls shall accompany original Shop Drawing submittals.

6. Installation instructions shall accompany original Shop Drawing submittals.

7. Each submittal shall identify applicable Standards, such as ASTM number or Federal Specification number.

8. All information not pertinent shall be removed from the submittal, or shall be crossed out.

D. When resubmission is required, the County/Professional will return only two (2) marked up copies. A third submission from the same manufacturer will not be accepted.

1.08 SUBSTITUTIONS

A. The substitution requirements of this Section are in addition to the requirements of the General Conditions and Supplementary Conditions.

B. When a particular product is specified or called for, it is intended and shall be understood that the proposal tendered by the Bidder includes those products in his Bid. Substitutions will only be considered in cases where original materials are unavailable or in an instance where substitute can be proven superior in its planned application

C. The intent of these specifications is to provide the County with a quality facility without discouraging competitive bidding. For products specified only by reference standards, performance and descriptive methods, without naming manufacturer's products, the Contractor may provide the products of any manufacturer complying with the Contract Documents, subject to the review of product data by the County/Professional as specified herein.

D. The County/Professional's approval is required for substitutions.

E. The Contract is based on the materials, equipment and methods described in the Contract Documents.

F. The County/Professional will consider proposals for substitution of materials equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by the County/Professional to evaluate the proposed substitution.

G. Do not substitute materials, equipment or methods unless such substitution has been specifically approved for this Work by the County/Professional in writing. The Contractor must provide a submittal per this Section specifically requesting approval of the substitution. Failure to specifically identify the requested substitution may invalidate approval of a submittal.

1.09 AVAILABILITY OF SPECIFIED ITEMS

A. Verify prior to bidding that all specified items will be available in time for installation during Construction for orderly and timely progress of the Work.

B. In the event that specified items will not be available, notify the County/Professional prior to receipt of proposals.

1.10 OPERATING MANUALS

A. Submit all manuals in accordance with requirements of Divisions 2 through 16 of the Contract Specifications and Section 01700 "Project Closeout."

1.11 WARRANTIES, GUARANTEES AND BONDS

A. Provide as required by Technical Sections of the Specifications and Sections 01700 "Project Closeout" and Section 01740 "Warranties and Bonds."

1.12 CADD FILES

A. The Professional's CADD files will be available on a limited basis to qualified firms at the County’s prerogative. The procedure for requesting such files is noted elsewhere in these documents and there is a cost associated with handling and reproduction. Recipients are cautioned that these files may not accurately show actual conditions as constructed. Users are responsible to verify actual field conditions.

B. The Professional’s Drawings are to be used only for background information. If the Professional’s Drawings are just reproduced and resubmitted (e.g. for ductwork drawings) they will be rejected.

C. Copies of data furnished by the County/Professional to Contractor or Contractor to County/Professional that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the

user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

D. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60-days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

E. When transferring documents in electronic media format, the transferring party makes no representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

1.13 PROGRESS PHOTOGRAPHS

A. Photographs and digital pictures shall be in color. Provide 1 copy of each digital picture on each of three (3) CDs and provide 1 print of each photograph in two (2) separate albums.

B. Photographs shall be from locations to illustrate the condition of Construction and state of progress adequately.

C. Provide up to 12 digital photographs of views randomly selected by the County, taken prior to any construction and prior to each scheduled Application for Payment.

D. Deliver electronic images, prints, and negatives to the County.

E. Each print shall be single weight paper with glossy finish and the overall dimension shall be 7-1/2-inch x 10-inches (19.05 x 25.4 cm). The print shall be clear, sharp and free of distortion after the enlargement from the negative.

F. Provide loose-leaf albums for each set of photographs to hold prints with a maximum of 50-leaves per binder.

G. Each print shall be protected by flexible, transparent acetate or plastic sheet protector leaves with metal reinforced holes. Two (2) extra leaves shall be provided in each binder.

H. Capture and provide digital, ortho-rectified, true-color, aerial photographs of the complete project site prior to start of Construction and at final completion. A final 6-inch or less ground pixel resolution is required. If using traditional photography, the photos will need to be captured at an appropriate scale and scanned at a high enough dpi to yield a final ground pixel size of 6-inches or less. If captured digitally, a final 6-inches or less ground sample distance is required. The final orthorectified photos shall use a projection of NAD 27, State Plane West and all vertical reference shall be NAVD 88, US feet. All orthophoto mosaics shall meet a final accuracy of plus or minus 5-feet.

I. Provide a total of four (4) true-color, color balanced orthophoto mosaic prints. Three (3) prints each of the pre and post construction (final completion) orthophoto mosaics, for a total of six (6). Each orthophoto mosaic print shall be on double-weight paper with glossy finish and shall have overall dimensions of 36-inches x 58-inches. Two (2) copies of each of the digital orthophoto mosaics shall be supplied in Geotiff format on disk for each time period (pre and post construction). The final color balanced, true-color orthophoto mosaics will be projected in NAD 27, State Plane West and all vertical reference shall be NAVD 88, US feet and shall meet a final accuracy of plus or minus 5-feet.

J. The Contractor shall provide before and after photographs of each portion of the site. The below ground facilities shall include all equipment, walls, floor, piping, supports and entrance. At major locations, photographs shall include before, during, and after prints and all prints shall be placed in binders in ascending date order to show the Work as it progresses.

K. Descriptive Information:

1. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:

a. ORANGE COUNTY, FLORIDA
b. (ENTER PROJECT NAME)
c. BID No. (Enter Bid Number)
d. CONTRACTOR: (Name of Contractor)
e. DATE: (When photo was taken)
f. PHOTO NO.: (Consecutive Numbers)
g. PHOTO BY: (Firm Name of Photographer)
h. LOCATION: (Description of Location and View)

2. The Contractor shall provide the Professional with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs.

1.14 PROJECT RECORD DOCUMENTS

A. Project Record Documents shall be submitted in accordance with Section 01720 "Project Record Documents" of these specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Article 9 of the General Conditions contains additional provisions regarding submittals.

B. Preliminary Shop Drawing Data: Within 20-days after the Award of the Contract or before the Pre-Construction Meeting, the Contractor shall submit to the County/Professional a complete listing of manufacturers for all items for which Shop Drawings are to be submitted.

C. Shop Drawing Submittal Schedule: Within 30-days after the Notice to Proceed, the Contractor shall submit to the County/Professional a complete schedule of Shop Drawings submittals with the respective dates for submission, the beginning of manufacture, testing and installation of materials, supplies and equipment, noting those submittals critical to the progress schedule.

D. Submittal Log: An accurate updated log of submittals will be maintained by the Contractor and subject to review by the County/Professional at each scheduled progress meeting.

E. If the Contractor considers any correction indicated on the Drawings to constitute a change to the Contract Drawings or specifications, the Contractor shall give written notice thereof to the County/Professional. This does not constitute a change order until accepted by the County.

F. Shop Drawing and submittal data shall be reviewed by the County/Professional for each original submittal and first resubmittal; thereafter review time for subsequent resubmittals shall be charged to the Contractor. The Contractor shall reimburse the County for services rendered by the County/Professional at the rate multiplied by the County's Professional multiplier based on the fee schedule provided to the County for this Project. If a County engineer is performing any portion of the review, this fee is based upon the hourly rate of the engineer times the County's multiplier for overhead, benefits, and expenses. The Contractor agrees that the County shall deduct such charges from the Contract Amount by a deductive Change Order.

G. Contractor Shop Drawing and Sample submittals shall include 5 copies in addition to any other copies that the Contractor wants returned. The County will retain 5 copies of approved submittals.

H. Identify Project, Project Number, date, dates of previous submittals, Contractor, Sub-Contractors, suppliers with their addresses, pertinent Drawings by sheet and detail number, and Specification Section number, as appropriate. Identify all deviations from the Contract Documents. Provide space for Contractor and Professional review stamps.

I. Contractor's delivery of Shop Drawings for review shall follow a reasonable sequence, as is necessary to support the dates on the Progress Schedule and avoid an overload of Shop Drawings awaiting review at any one time. Coordinate submittal of related items.

J. Submit Shop Drawings per the schedule of Shop Drawing submittals, inserted in 1 loose-leaf binder, with tabs and index to the County/Professional. All individual submittal sheets inserted in said binder must be clearly marked and referenced to

proper paragraph and subparagraph of specifications. Cross out any items on sheets which constitute information not pertaining to equipment specified. Clearly mark all components that are provided as "optional" by manufacturer. Shop Drawings shall be approved by the Contractor prior to submittal to the County/Professional. Shop Drawings will be reviewed by the County/Professional. After County/Professional approval, reproduce and distribute in accordance with requirements herein.

K. All submissions of Shop Drawings, brochures and catalog cuts shall be accompanied by a transmittal letter listing the Drawings submitted by number and title.

L. When engineering calculations and/or professional certification of performance criteria of materials, systems, and/or equipment are required, the County is entitled to rely upon the accuracy and completeness of such calculations and certifications submitted by the Contractor. Calculations, when required, shall be submitted in a neat, clear and in an easy to follow format. Such calculations and/or certifications shall be signed and sealed by a Professional Engineer registered in the State of Florida.

M. Distribute copies of reviewed submittals to concerned parties. Instruct recipients to promptly report any inability to comply with provisions.

N. Prior to submission of Shop Drawings and samples, the Contractor shall stamp and sign the submittals. Any submission which, upon examination by the County, shows evidence of not having been thoroughly checked, or is not in compliance with the provisions of this Section will be returned to the Contractor for completion before it will be considered for review.

O. Notify the County of the need for making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the material or equipment Contactor proposes to supply.

P. On resubmittals, direct specific attention in writing or on the revised Drawings or sample to revisions other than the corrections required by County on previous submissions.

Q. All drawings, schematics, manufacturer’s product data, certifications and other drawing submittals required for a system specification shall be submitted at one time as a package to facilitate interface checking.

R. The County will distribute Shop Drawings as follows for the indicated action taken:

SHOP DRAWING SUBMITTAL DISTRIBUTION

Representative Party	No Exception Taken or Make Correction Noted			Rejected or Revise & Resubmit		
	Submittal Transmittal	Shop Drawing	Review Comment Sheet	Submittal Transmittal	Shop Drawing	Review Comment Sheet
Engineer	2 Copies	File Copy	1 Copy	Original	File Copy	1 Copy
Contractor (see Note 1)	2 Copies	1 Copy Each Submittal	1 Copy	1 Copy	All Copies Except Engineers	1 Copy
County	1 Copy	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy
Inspector	2 Copies	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy
Project Record Data (see Note 2)	1 Copy	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy

NOTES:
1. Contractor shall distribute additional copies to Subcontractors as required.
2. Stored by Contractor to be furnished to County upon closeout.

S. All Shop Drawings shall be accompanied with a transmittal letter providing the following information:

1. Project Title and Contract Number
2. Date
3. Contractor's name and address
4. The number of each Shop Drawing, project data, and sample required
5. Notification of Deviations from Contract Documents
6. Submittal Log Number conforming to specification section numbers
   a. Submit each specification section separately.
   b. Identify each Shop Drawing item required under respective specification section.
   c. Identify resubmittal using specification section followed by A (first resubmittal), B (second resubmittal)…etc.

3.02 CONTRACTOR'S REVIEW

A. Contractor's Responsibility for Coordination: Where the dimension, size, shape, location, capacity or other characteristic affects another item, and where the

Contractor selects, fabricates or installs related or adjacent products to be used, the Contractor shall be responsible for coordination of related items. The Contractor shall insure that a proper exchange of information takes place prior to or during preparation of each submittal and that submittals reflect such coordination. The notation "verify" or "coordinate" on the Drawings indicates the necessity for Contractor coordination in the particular instances used.

B. Contractor's Checking: When checking submittals from Subcontractors and suppliers, the Contractor shall mark all sets, indicating his corrections and comments in blue or green. Copies marked in red may be returned for revision.

C. The Contractor is responsible to deliver and pick-up all submittals in a timely manner at the County/Professional's designated office. The Contractor is responsible for all related costs and expenses for the transmittal of such submittals.

3.03 COUNTY'S / PROFESSIONAL'S REVIEW

A. Corrections or comments made on Shop Drawings during review do not relieve the Contractor from compliance with the requirements of Drawings and Specifications. This check is only for review of general conformance with the design concept of this Project and general compliance with information given in Contract Documents. Any substitutions or changes shall be properly noted.

B. No action will be taken on "rough-in" Shop Drawings for plumbing and electrical connections when the items of equipment are not included in the same submittal.

C. Review Time:

1. On a normal basis, each submittal will be returned to the Contractor within 15 working days of the date it is received. Some submittals may require additional time.

2. If, for any reason, the above schedule cannot be met, the Contractor will be so informed within a reasonable period and the Schedule of Submittals revised. If the specific submittal affects the critical path, the Contractor shall immediately notify the County/Professional in writing. In the event of separate submittals of individual components of a system, these submittals may be held until all components of the system are submitted, and the Contractor will be so notified.

END OF SECTION

SECTION 01310

PROGRESS SCHEDULES

PART 1 - GENERAL

1.01 REQUIREMENT

A. The Contractor will submit precedence method cost loaded Critical Path Method (CPM) Progress Schedules to the County depicting the approach to prosecution and completion of the Work. This requirement includes, but is not limited to the Contractor's approach to Activity cost loading, recovering schedule and managing the effect of changes, substitutions and Delays on Work sequencing.

B. The Progress Schedule shall show how the Contractor's priorities and sequencing for the Work (or Work remaining) conform to the Contract requirements and the sequences of Work indicated in or required by the Contract Documents; reflect how the Contractor anticipates foreseeable events, site conditions and all other general, local and prevailing conditions that may affect cost, progress, schedule, furnishing and performance of the Work; and show how the Contractor's Means and Methods translate into Activities and logic.

C. The Progress Schedule will consist of the Initial Submittal, Payment Submittals and Revision Submittals. Upon acceptance by the County, the Initial submittal will become the As-Planned Schedule for the Work. Revision submittals upon acceptance will become the As-Planned Schedule for the Work remaining to be completed as of the submittal date for that Revision.

D. References to the Critical Path Method (CPM) are to CPM construction industry standards that are consistent with the requirements of this Section.

1.02 GLOSSARY OF TERMS

A. The following terms, whether or not already defined elsewhere in the Contract Documents, have the following intent and meanings within this Section:
   1. Activity Value (Value): That portion of the Contract Price representing an appropriate level of payment for the part of the Work designated by the Activity.
   2. As-Planned Schedule: The first, complete Initial Progress Schedule submitted by the Contractor with the intent to depict the entire Work as awarded and accepted by the County or returned as no resubmittal required.
   3. Contract Float: Days between the Contractors anticipated date for completion of the Work, or of a specified portion of the Work, if any, and the corresponding Contract Time.

4. CPM Schedule: The Progress Schedule based on the Critical Path Method (CPM) of scheduling. The term Critical Path means any continuous sequence of Activities in the Progress Schedule controlling, because of their sum duration, the Early Date of a pertinent, specified Contract Time.
5. Early/Late Dates: Early/late times of performance, based on CPM calculations, for an Activity in the Progress Schedule. Early Dates will be based on proceeding with all or part of the Work on the date when the corresponding Contract Time commences to run. Late Dates will be based on completing all or part of the Work on the corresponding Contract Time, even if the Contractor plans early completion.
6. Milestones: Key, pre-determined points of progress in the completion of a facility, denoting interim targets in support of the Contract Times. Milestones may pinpoint targets for key excavation and substructure events, significant deliveries, critical path transition from superstructure to piping and electrical rough in and building enclosure. Also, hook-up of mechanical and electrical equipment, availability of power for testing, equipment shakedown, training of County personnel, start□-up, Substantial Completion and other events of like import.
7. Official Schedule: The Initial or most recent Revision Submittal accepted by the County or returned as no resubmittal required and the basis for Payment Submittals until another Revision Submittal is submitted and accepted. The accepted Initial Submittal is also the As-Planned Schedule.
8. Payment Submittal: A monthly Progress Schedule update reflecting progress and minor adjustments on the Activities, sequencing and restraints for Work remaining.
9. Total Float: Days by which an activity may slip from its Early Dates without necessarily extending a pertinent Contract Time. Total Float at least equals Contract Float. Total Float may also be calculated and reported in working Days. When an activity is delayed beyond Early Dates by its Total Float it becomes a Critical Path activity and if delayed further will impact a Contract Time.

1.03 QUALITY ASSURANCE

A. The Contractor may self-perform the Work covered by this Section or employ a Subcontractor, subject to the County's consent. Employment of a scheduling Subcontractor shall not in any way alter or reduce the Contractor's obligations under the Contract Documents.

B. The Contractor will obtain a written interpretation from the County, if the Contractor believes that the selection of activities, logic ties and/or restraints requires a written interpretation of the Contract Documents. With each submission, the Contractor will point out by specific, written notation, any Progress Schedule feature that may reflect variations from any requirements of the Contract Documents.

C. It is the Contractor's responsibility to obtain information directly from each Subcontractor and Supplier when scoping their respective Activities, Values, logic ties and restraints.

D. Neither Acceptance nor Review of any Progress Schedule will relieve the Contractor from the obligation to comply with the Contract Times and any sequence of Work indicated in or required by the Contract Documents and to complete, within the Contract Times, any Work omitted from that Progress Schedule.

E. Neither Acceptance nor Review of any Progress Schedule will imply approval of any interpretation of or variation from the Contract Documents, unless expressly approved by the County through a written interpretation or by a separate, written notation on the returned Progress Schedule Submittal.

1.04 MILESTONES AND SCHEDULE RECOVERY

A. The County will select Milestones and Milestone Dates on the basis of the As-Planned Schedule. As the Official Schedule is revised, Milestone Dates will be revised accordingly. Milestone Dates will serve as target dates.

B. Whenever any Activity slips by 14 or more Days from the Late Date for an activity in the Official Schedule, Milestone Dates selected by the County, or a pertinent Contract Time, the Contractor will deliver a Revision Submittal documenting the Contractor's schedule recovery plan and/or a properly supported request for an extension in the Contract Time. The narrative will identify the Delay and actions taken by the Contractor to recover schedule, whether by adding labor, Subcontractors or construction equipment, activity re-sequencing, expediting of submittals and/or deliveries, overtime or shift Work, and so forth. Activity shortening and overlapping shall be explained as to their basis (and be supported by increases in resources).

C. Upon evaluation of that Revision Submittal, if the County determines there is sufficient cause, the County may withhold liquidated damages or provide a notice of intent to do so, if schedule is indeed not recovered, and/or may give a notice of default.

1.05 PROGRESS SCHEDULE SOFTWARE

A. The scheduling software employed by the Contractor to process the Progress Schedule will be the current version of Primavera P6.0®, or Primavera® Contractor 5.0 CPM scheduling software.

B. If the Contractor intends to use companion schedule reporting, analysis or graphics software tools, the Contractor will furnish to the County descriptive materials and samples describing such software tools.

1.06 NON-PERFORMANCE

A. The County may refuse to recommend all or any part of any payment, if the Contractor fails, refuses or neglects to provide the required Progress Schedule information on a timely basis. Partial payments without a properly updated Progress Schedule shall be returned to the Contractor as non-conforming.

B. If justified under the circumstances, the County also may prepare alternate Progress Schedules, as appropriate, and deduct from the Contract Amount all related costs by Change Order and/or take other action commensurate with the breach.

1.07 REPORTS, SCHEDULES AND PLOTS

A. Schedule Reports will include Activity (ID) code and description, duration, calendar, Early Dates, Late Dates and Total Float. Separate Schedule Reports will tabulate, for each Activity, all preceding and succeeding logic types and lead times, whether CPM Plots displaying logic ties are appended or not.

B. CPM Schedule Plots will be plotted on a suitable time scale and identify the Contract Times, Critical Paths, phases and work areas on 24-inch x 36-inch or smaller sheets. Activities will be shown on the Early Dates with Total Floats noted by Late Date flags. For Payment and Revision Submittals plot a target comparison based on the current Official Schedule.

C. The Activity Value report will tabulate Activity code and description and Activity Value, percent complete and earned value as calculated by the scheduling software. Cash flow plots shall be provided showing the monthly and cumulative actual and planned earned values with curves shown for Early and Late Dates in the schedules. For Payment and Revision Schedule submittals, the cash flow curves shall also plot the most current Official Schedule planned earnings curves.

D. Each submittal shall include listings of all added and deleted activities, logic, constraints, Activity Value changes and update information vs. the previous Progress Schedule submittal. This list may be manually prepared or generated by accessory software that will generate such listings.

1.08 NARRATIVE REQUIREMENTS

A. The Initial Submittal narrative will describe the Contractor’s approach to prosecution of the Work and the basis for determination of activity durations, sequence and logic, including the Contractor's management of the site, e.g., lay down, staging, parking, etc.; Contractor’s phasing of the Work; use of crewing and construction equipment; identification of non-work County/Professional’s, shifts, weekend Work and multiple calendars applied to activities and an explanation of the basis for restraint dates.

B. Revision and Payment Submittal narratives will explain any changes to the approach or planning referred to in Paragraph A above on account of any change, delay, schedule recovery, substitution and/or Contractor-initiated revision occurring since the previous submittal.

C. Each narrative will list the Critical Path Activities and compare Early and Late Dates against Contract Times and Milestone Dates. Narratives shall also recap progress and Days gained or lost vs. the current Official Schedule, and identify delays, their extent and causes.

D. The Initial Submittal narrative will describe all delays occurring since Contract Award and all pending and anticipated "or equal" and substitution proposals. Payment and Revision Submittal narratives will describe any new delays and shall certify that the Contractor has not been delayed, as of the cut off date, by any acts or omissions of the County, except as otherwise specifically stated.

1.09 ACTIVITY REQUIREMENTS

A. Separate activities will identify permits, design when included in the Work, construction, Submittal preparation and review (and resubmission and re-review), deliveries (site or storage), testing, start-up, commissioning and Punch List.

B. Activities will be detailed to the extent required to show the transition of trade Work. Activities will delineate the progression of the Work.

C. Activities will not combine separate or non-concurrent items of Unit Price or lump sum Work.

D. Activity durations will equal the Work Days required to sufficiently complete the Work designated by the Activity, (i.e., when finish-to-start successors could start, even if the Activity is not quite 100% complete). Installation Activities will last from 10 to 40 workdays. Submittal review activity durations shall conform to specified timeframes.

E. Activities will be assigned consistent descriptions and identification codes. Sort codes will group Activities by meaningful schemes.

F. Activities will be assigned Activity Values as appropriate and needed to reasonably allocate the Contract Amount to the time periods that they will be earned and eligible for payment based on the Progress Schedule and Schedule of Values. Separate pay activities may be used to simplify cost loading of the Progress Schedule. When used, pay activities shall be loaded with the cost of Work that is included, at no cost, in related (generally, concurrent) CPM activities. Pay activities shall not control the rate of progress; however, their start and finish dates shall be consistent with those of their related CPM activities to ensure accurate Early Date and Late Date cash-flow plots.

1.10 FLOAT TOLERANCES AND FLOAT OWNERSHIP

A. Any Progress Schedule with Early Dates after a Contract Time will yield negative Total and Contract Floats, whether shown/calculated or not. Any Revision Submittal with less than negative 20-days of Float will be returned as "Revise and Resubmit," unless a time extension is requested or the County assesses liquidated damages or gives notice of intent to do so, in the event schedule is not recovered.

B. Float calculated from the definitions given in this Section supersede any conflicting Float values in any early completion Progress Schedule.

C. Neither the County nor the Contractor own the Float time, the Project owns the Float time. Neither the County nor the Contractor use of positive Total Float will impact a Contract Completion Date or justify an extension of Contract Time.

1.11 SUBMITTALS

A. Each Progress Schedule Submittal will consist of a narrative, 5 copies of the required reports and plots and an optical ROM data disk with the Contractor's corresponding schedule and schedule layout files in Primavera ".XER" format.

B. The County will review Progress Schedule Submittals and return a review copy within 14-days after receipt and the Contractor shall, if required, resubmit within 7-days after return of the review copy.

C. Requirements for the Initial Submittal:
   1. Within 20-days after receipt of Notice to Proceed and prior to commencing Work on the Project, prepare and submit to the County the Initial Submittal of the Progress Schedule for the Work. The Initial Submittal will show the Work as awarded, without delays, Change Orders or substitutions.
      a. Activity Values will prorate Schedule of Values costs and/or pay items through to Activities. Provide a cross-reference listing with two parts; a part that will list each activity with the respective amounts allocated from each Schedule of Values and Unit Price Item making up the total value of each activity and a second part that will list the Schedule of Values and Unit Price Items with the respective amounts allocated from each activity that make up the total value of each item.
   2. After the As-Planned Schedule is established, the County will select Milestones and record the Milestone Early and Late Dates. As the Official Schedule evolves, Milestone Dates will be revised accordingly.
   3. If the County refuses to endorse the Initial Submittal (or a resubmission) as "Resubmittal Not Required," the As-Planned Schedule will not be established. In that event, the Contractor will continue to submit Payment and Revision Submittals reflecting progress and the Contractor's approach to remaining Work. The County will rely on the available Payment and Revision Submittals, subject to whatever adjustments it determines appropriate.

D. Requirements for Payment Submittals:
   1. Payment Submittals with progress up to the closing date and updated Early Dates and Late Dates for progress and remaining Activities will be due with each Progress Payment. As-built data will consist of actual dates, percent complete, earned payment, changes, Delays and other significant events occurring before the closing date.
   2. Activity percent complete and earned value should indicate a level of completion that corresponds to the Application for Progress Payment for the same period. The earned value should be calculated by the scheduling software as Activity Value times percent complete. Explanation should be provided whenever the cumulative earned value of activities in a Payment Submittal is not within 10% of the value of Work completed as represented in the corresponding Application for Progress for Payment.

3. At the Contractor's option, a Payment Submittal may overlay minor adjustments on activities and sequencing for Work remaining. This excludes Activity re-scoping to reflect Delays, changes, schedule recovery or substitutions.

E. Requirements for Revision Submittals:
   1. Revision Submittals will be submitted when necessary because of major changes or delays affecting activities, sequencing or restraints for Work remaining and/or to put forth a schedule recovery plan. Revision Submittals may also be required because of Contractor-initiated re-planning, or when Contractor plans to perform Work ahead or out-of-sequence that will require additional testing or inspection personnel, or when requested by the County when Work is performed out-of-sequence from the current Official Schedule such that the number of Days gained or lost can not be determined or the scheduled dates of completion of the Work in a Payment Submittal are not viewed as reliable.
   2. If requesting a time extension, the Revision Submittal should show the impact of the delay after incorporating reasonable mitigation to minimize the impact and illustrate how the number of Days requested time extension was determined. The delay should be determined as the change in the forecast Contract Completion Date(s) resulting solely from delays that entitle the Contractor to a time extension as provided in the General Conditions. Any and all Contractor slippage and delay occurring prior to and concurrent with the delay potentially entitling the Contractor to a time extension shall be incorporated in the Revision and explained such that the concurrent and non-concurrent periods of delay are indicated. If the Contractor does not follow the procedures contained in this Section or, if the Contractor's analysis is not verifiable by an independent, objective evaluation by the County using the electronic files and data furnished by the Contractor, any such extension in Contract Time will not be granted.

F. Retrospective Delay Analysis.
   1. If the County/Professional refuses to endorse any Revision Submittal as "Resubmittal Not Required," the Contractor and County will use the latest Official Schedule when evaluating the effect of Delays on Contract Time and/or Contract Price. The procedure to be used will consist of progressively updating the latest Official Schedule at key closing dates corresponding to starting and finishing dates of the delays and/or dates the delays became critical or dates the Critical Path may have changed for other reasons. For each Progress Schedule iteration, slippage between actual Milestone Dates and Initial Milestone Dates will be correlated to Delays occurring solely in that iteration.
   2. For each iteration, revisions in Activities, logic ties and restraints affecting Work after the closing date will be included in that Progress Schedule only if they meet any of the following conditions. First, they are Progress Schedule revisions that the County consented to contemporaneously (i.e., before the closing date) in writing. Second, they reflect comments or objections raised by or on behalf of the County and that were actually confirmed by the as-built progress. Lastly, they represent Contractor's schedule recovery plans or other Progress Schedule revisions that were actually confirmed by the as-built progress.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01370
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DEFINITION

A. Schedule of Values: Schedule that divides the Contract Amount into pay items, such that the sum of all pay items equals the Contract Amount for the Work, or for any portion of the Work having a separate specified Contract Amount.

1.02 REQUIREMENT

A. The Schedule of Values established as provided in the General Conditions will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the County. Progress payments on account of Unit Price Work will be based on the number of units completed.

B. No payment will be made for Work performed on a lump sum contract or a lump sum item until the appropriate Schedule of Values is approved by the County.

C. The equitable value of Work deleted from a lump sum contract or lump sum item shall be determined from the approved Schedule of Values.

1.03 SUBMITTALS

A. Submit 3 copies of a Preliminary Schedule of Values within 15-days after the recommended award of the Contract.

B. Submit 3 copies of a proposed final Schedule of Values within 20-days after receipt of Notice to Proceed as per the General Conditions.

C. Submit the Schedule of Values, typed, on EJCDC 1910-8-E form or Orange County forms or spreadsheets provided by County. The Contractor's standard form or electronic media printout will be considered for acceptability by the County.

D. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest dollar.

E. Coordinate listings with the Progress Schedule.

F. For items on which payments will be requested for stored materials or equipment, list sub-values for cost of stored products with taxes paid.

G. Submit a sub-schedule for each separate stage of Work specified in Section 01010 "Summary of Work."

H. The sum of values listed shall equal the total Contract Amount for the Work or the Contract Amount for a part of the Work with a separate Contract Amount provided for by the Contract Documents.

I. When the County requires substantiating information, submit data justifying line item amounts in question.

1.04 UNIT PRICE CONTRACTS

A. For unit price contracts, the bid item prices on the Project Bid Schedule shall be used as the basis for the schedule of values. The Contractor shall resubmit the bid item prices in the format described herein, and may, at its option, or if requested by the County, divide the items in the Project Bid Schedule into sub-items to provide a more detailed basis of payment.

1.05 LUMP SUM CONTRACTS

A. For lump sum contracts, if the Work involves separate facilities, e.g. multiple pump stations, the cost of the Work shall be separated by each facility and into schedule of value items. Break principal subcontract amounts down into these items; The lump sum cost for each facility shall be submitted individually and split into the schedule of values listed in items 1 through 3.

1. General Requirements
   a. 10.1 General
2. Site Work
   a. 11.1 Miscellaneous
   b. 11.2 Road Work (Access Drive)
   c. 11.3 Install/Replace Fence or Wall
   d. 11.5 Relocate or Remove Ductwork/ Fan Structure
3. Pump Station
   a. 14.1 Master Pump Station Wall Project

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01380
AUDIO – VISUAL DOCUMENTATION

PART 1 - GENERAL

1.01 PURPOSE AND DESCRIPTION OF WORK

A. The purpose of the audio - visual documentation is to provide the County with regularly documented audio - visual records of the Construction process from the existing conditions through final completion.

1.02 PRE-CONSTRUCTION VIDEO REQUIREMENTS INCLUDED

A. The Contractor shall employ a professional videographer to take a Pre-Construction video of the entire site including the areas of adjacent properties within 100-feet of the limits of Work and shall be made within 30-days of Work beginning. Special attention shall be made to show the existing paved roads, shoulders, signs, and other existing features.

B. The Contractor shall submit a quality audio-video recording documenting Pre-Construction field conditions for the entire project. When the Work includes construction of water, wastewater, reuse, or other lines in the vicinity of any street or road, the Contractor shall take digital audio-video recordings of existing conditions along both sides of the street or road. The Pre-Construction video shall be submitted to the County and accepted prior to commencing any Work or using any Contractor laydown areas.

C. Electronic digital photography shall also be used as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Professional's and County's offices.

PART 2 - PRODUCTS

2.01 AUDIO-VIDEO RECORDING

A. Each audio-video recording shall be saved on appropriate DVD media viewable on standard DVD players or computer.

B. Each DVD shall contain the following information and arrangement at the beginning as a title screen:

Orange County, Florida
PROJECT NAME
PROJECT NUMBER
CONTRACTOR: (Name of Contractor)

DATE: (When photo was taken)
VIDEO BY: (Firm Name of Videographer)
LOCATION: (Description of Location(s) and View(s))

C. Each DVD recording section shall begin with an audio description of the County's name, Contract name and number, Contractor's name, date and location information such as street name, direction of travel, viewing side, etc.

D. Information appearing on the video recording must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.

E. Digital information to appear in the upper left corner shall be as follows:

1. Name of Contractor
2. Day, date and time
3. Name of Project & Specification Number

F. Time must be accurate and continuously displayed on the video record

G. Written documentation must coincide with the information on the DVD so as to make easy retrieval of locations at a later date.

H. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives.

I. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary shall be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees and shrubbery, structures, equipment, pavement, etc.

J. All DVDs and boxes shall bear labels with the following information:

1. DVD Number
2. County's Name
3. Date of Recording
4. Project Name and Number
5. Location and Standing Limit of Video

2.02 CONSTRUCTION PHOTOGRAPHS

A. The Contractor shall employ a competent photographer to take construction record photographs periodically during the course of the Work.

B. Prints: Date imprinted 8-inch x 10-inch high resolution glossy single weight color print paper; 5 sets, bound in 3-ring binders to be provided to the County with each respective Application for Payment and distributed by the County as follows:

1. County (2 sets)
2. Engineer (1 set)
3. Contractor (1 set)
4. Project Record Data (1 set stored by Contractor to be furnished to County upon Closeout)

PART 3 - EXECUTION

3.01 VIDEO VIEWS REQUIRED

A. Complete coverage shall include all surface features within 100-feet of the Work area to be used by the Contractor and shall be supported by appropriate audio description made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches, roadways, landscaping, trees, culverts, headwalls, and retaining walls, equipment, structures, pavements, manholes, vaults, handrails, etc. located within the work zone. Video coverage shall extend to the maximum height of all structures within this zone.

B. The video recorder shall take special efforts to point out and provide audio commentary on cracking, breakage, damage, and other defects in existing features.

C. All video recording shall be done during times of good visibility. No video recording shall be done during periods of visible precipitation, or when more than 10% of the ground area is covered with standing water, unless otherwise authorized by County.

D. Prior to commencement of audio-video recording, the Contractor shall notify the County in writing within 48-hours of the audio-video recording. The County may provide a designated representative to accompany and observe all video recording operations. Audio-video recording completed without a County Representative present will be unacceptable unless specifically authorized by the County.

3.02 AUDIO-VIDEO REQUIREMENTS

A. Major Locations:

1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the Construction before construction starts.
2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate video explaining what is being shown. All master videos shall be delivered to the County.
3. The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views of all visible house and business addresses shall be used. In areas where the proposed construction location will not be readily apparent to the video recording viewer, highly

visible yellow flags shall be placed, by the Contractor, in such a fashion as to clearly indicate the proposed centerline of Construction. When conventional wheeled vehicles are used as conveyances for the recording system, the vertical distance between the camera lens and the ground shall not exceed 10-feet. The camera shall be firmly mounted such that transport of the camera during the recording process will not cause an unsteady picture.

4. All video recording shall be done during time of good visibility. No video recording shall be done during precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.

5. The average rate of travel during a particular segment of coverage shall be directly proportional to the number, size and value of the surface features within that construction area's zone of influence. The rate of speed in the general direction of travel of the vehicle used during taping shall not exceed 44-feet per minute.

3.03 PHOTOGRAPHS

A. A minimum of 3 views (top, upstream, and downstream) each shall generally be taken prior to backfilling pipelines or structures. Photographs shall be provided for:

1. Utility conflicts/relocations
2. Manholes
3. Pump stations
4. Boring and jacking
5. Directional drilling pipe entrance and exit
6. Valve installation
7. Air release valve installation
8. Fire hydrant assembly

B. Photo Identification

1. Name of Project
2. Name of Structure
3. Orientation of View
4. Date & Time of Exposure
5. Film numbered identification of exposure

END OF SECTION

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SECTION 01400
QUALITY CONTROL

PART 1 - GENERAL

1.01 SITE INVESTIGATION AND CONTROL

A. Contractor shall verify all dimensions in the field and check field conditions continuously during construction. Contractor shall be solely responsible for any inaccuracies built into the Work due to Contractor's failure to comply with this requirement.

B. Contractor shall inspect related and appurtenant Work and report in writing to County any conditions which will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at Contractor's sole cost and expense.

1.02 INSPECTION OF THE WORK

A. The Work shall be conducted under the general observation of representatives of the County acting on behalf of the County to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The County shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated. Inspection by the County are in addition to the inspections required of Contractor by his QC Representatives.

B. The presence of the County, however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the County. Further, no requirement of this Contract may be waived or modified except by change order or formal (written) substitution approval.

C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no materials or articles shall be used in the Work until they have been inspected and accepted by the County. No Work shall be backfilled, buried, cast in concrete, hidden, or otherwise covered until it has been inspected. Any Work so covered in the absence of inspection shall be subject to uncovering. Where uninspected Work cannot be uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper inspection and no additional payment will be allowed therefore.

D. The Contractor is responsible for the Quality of his own work and shall designate a qualified individual, to be approved by the County, who will ensure that all work is performed in strict accordance with the Contract Documents. This quality

representative shall inspect the work for the Contractor and provide to the County and the Contractor a report outlining all work accomplished, all inspections, and all testing performed for all days when work is performed. The objective of this report is to provide "Objective Evidence of Compliance" by the Contractor with the requirements of the Contract.

1.03 TIME OF INSPECTION AND TESTS

A. Samples and testing required under these Specifications shall be furnished and prepared in ample time for the completion of the necessary tests and analyses before said articles or materials are to be used. Except as otherwise provided in the Contract Documents, performance of the required tests will be by the Contractor and all costs therefore will be borne by the Contractor at no cost to the County. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under this Contract, the County shall be notified not less than 24-hours in advance to request inspection before beginning any such Work of covering. Failure of the Contractor to notify the County at least 24-hours in advance of any such inspections shall be reasonable cause for the County to order a sufficient delay in the Contractor's schedule to allow time for such inspection, any remedial, or corrective work required, and all costs of such delays, including its impact on other portions of the Work, shall be borne by the Contractor.

1.04 SAMPLING AND TESTING

A. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered. However, the County reserves the right to use any generally accepted system of inspection which, in the opinion of the County, will ensure the County that the quality of the workmanship is in full accord with the Contract Documents.

B. Any waiver of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief form the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the County shall reserve the right to make independent investigations and tests as specified in the following paragraph and, upon failure of any portion of the Work to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the County to require the removal or correction and reconstruction of any such Work.

D. In addition to any other inspection or quality assurance provisions that may be specified, the County shall have the right to independently select, test, and analyze, at the expense of the County, additional test specimens of any or all of the materials to be used. Results of such tests and analyses shall be considered along with the tests or

analyses made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed provided that wherever any portion of the Work is discovered, as a result of such independent testing or investigation by the County which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such Work shall be borne by the Contractor.

1.05 RIGHT OF REJECTION

A. The County shall have the right at all times and places to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site. If the County or inspector, through an oversight or otherwise, has accepted materials or Work which is defective or which is contrary to the Contract Documents, such material, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected by County.

B. Contractor shall promptly remove rejected articles or materials from the site of the Work after notification or rejection.

C. All costs of removal and replacement of rejected articles or materials, as specified herein, shall be borne by the Contractor.

D. If the Contractor fails to remove or replace defective work after notification to do so, the County may have the work removed and replaced by others and deduct all costs from the Contractor's pay requests.

1.06 TESTING LABS

A. All geotechnical testing laboratory services for field testing will be paid by the County. The lab(s) shall function as independent lab(s) and report independently to the County and the Contractor. The test lab(s) may not approve or allow any deviation from the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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SECTION 01410
TESTING AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. County will employ, and pay for services of an Independent Testing Laboratory to perform Testing specifically indicated on the Contract Documents or specified in the Specifications and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.

2. Contractor shall cooperate with the laboratory to facilitate the execution of its required services.

3. Employment of laboratory by County shall in no way relieve Contractor's obligations to perform the Work of the Contract.

B. Related Requirements Described Elsewhere:

1. Conditions of the Contract.

2. Respective section of Specifications: Certification of products.

3. Each Specification section listed: Laboratory tests required, and standards for testing.

1.02 LABORATORY DUTIES: LIMITATIONS OF AUTHORITY

A. Submit 5 copies of inspection reports to the County. The reports shall include the following components:

1. Project title and County’s project number

2. Testing laboratory name and address

3. Date of report issuance

4. Name and signature of field technician

5. Date of inspections, sampling, and/or testing

6. Record of weather conditions

7. Identification of product tested and associated specification section

8. Testing location

9. Description of testing performed

10. Observations made regarding compliance with the Contract Documents

B. Laboratory is not authorized to:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents

2. Approve or reject any portion of Work

3. Perform any duties of the Contractor

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with County's personnel; provide access to Work and manufacturer's operations.

B. Secure and deliver to the County adequate representational samples of materials proposed to be used and which require testing.

C. Provide to the County the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.

D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacturer or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The County may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the County shall be allowed on account of such testing and certification.

E. Contractor shall not have direct contact with laboratory or laboratory personnel. All testing shall be coordinated through County.

F. Furnish incidental labor and facilities:

1. To provide access to Work to be tested.

2. To obtain and handle samples at the Project site or at the source of the product to be tested.

3. To facilitate inspections and tests.

4. For storage and curing of test samples.

G. Notify County sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests or inspections cannot be

performed after such notice, reimburse County for laboratory personnel and travel expenses incurred due to Contractor's negligence.

H. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required for the Contractor's convenience.

I. If the test results indicate the material or equipment complies with the Contract Documents, the County shall pay for the cost of the testing laboratory. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the Contract Documents, the Contractor shall pay for the laboratory costs directly to the County or the total costs shall be deducted from any payments due to the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01550
MAINTENANCE OF TRAFFIC

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The Contractor shall maintain public highway traffic within the limits of the project for the duration of the construction period, including any temporary suspensions of Work. Work shall also include construction and maintenance of any necessary detour facilities; furnishing, installing and maintaining of traffic control and safety devices during construction, control of dust, or any other special requirements for safe and expeditious movement of vehicular and pedestrian traffic.

B. Traffic Control shall be provided at the Contractor's expense by the Contractor's personnel or off-duty uniformed police officer, depending on and as required by the applicable traffic control requirements jurisdictional to the construction or road.

1.02 RELATED SECTIONS – N/A

1.03 DEFINITIONS

A. The term “Maintenance of Traffic” as used herein, shall include all facilities, devices, traffic control personnel, and operations as are required for the safety and convenience of the public as well as for minimizing public nuisance.

1.04 REFERENCES

A. Florida Department of Transportation Roadway and Traffic Design Standards

B. Manual on Uniform Traffic Control Devices

C. Public Works Requirements for Traffic Control of Non-Emergency Road Closures, Orange County, Florida.

1.05 SUBMITTALS

A. CONTRACTOR shall provide a traffic control plan which shall include proposed signs, markings, barricades, detour routes, sequencing, and phasing for vehicular and pedestrian traffic routes during construction. Plan will, at a minimum, require Orange County approval and approval from any other regulatory agencies having jurisdictional authority, as applicable.

B. Before closing any thoroughfare, the Contractor shall give written notice to and, if necessary, obtain a permit or permits from the duly constituted public authority having jurisdiction over the thoroughfare. Notice shall be given no less than 72 hours in advance of the time when it may be necessary in the process of construction to close such thoroughfare, or as may be otherwise provided in the approved Traffic Control Plan.

1.06 QUALIFICATIONS

A. Contractor shall provide a Worksite Traffic Supervisor, if necessary, who is responsible for initiating, installing, and maintaining all maintenance of traffic requirements as required by the Contract Documents and jurisdictional agencies. CONTRACTOR shall ensure that the Worksite Traffic Supervisor is certified by a Florida Department of Transportation approved training agency, which meets the Florida Department of Transportation's maintenance of traffic training requirement for advance training. Use approved alternate Worksite Traffic Supervisors when necessary.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 SITE PREPARATION

A. Contractor shall contact all property owners affected by construction and coordinate any temporary driveway closures and sequencing. Access shall be maintained for all property owners during construction.

B. Contractor shall remove existing pavement markings and remove or relocate existing signs as necessary to implement effective vehicular and pedestrian traffic control.

C. Contractor shall install signs, markings and barricades, and other necessary traffic control devices in accordance with approved traffic control plan.

3.02 MAINTENANCE

A. Contractor shall inspect traffic control devices on a daily basis and make modifications to the traffic control devices throughout the construction effort as needed to maintain vehicular and pedestrian safety.

B. Unless permission to temporarily close a street is received in writing from the proper authority (County, FDOT, etc.), all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to Owner.

C. The Contractor shall make provisions at all "open cut" street crossings to allow a minimum of one lane to be open for vehicular traffic at all times. Lane closing shall be as permitted by the local governing authority and shall be repaired to a smooth, safe driving surface immediately following the installation of pipe or conduit. Flagmen shall be required, in addition to barricades, signs and other protective devices at all lane closings.

D. Contractor shall wet unstabilized areas as necessary to control dust.

E. Contractor shall adjust traffic control devices as required under emergency conditions.

3.03 SPECIAL REQUIREMENTS

A. The Contractor shall carry on the Work in a manner that will cause a minimum of interruption to traffic. Where traffic must cross open trenches, the Contractor shall provide suitable bridges at street intersections and driveways. The Contractor shall post suitable signs indicating that a street is closed with necessary detour signs for the proper maintenance of traffic. No less than 48 hours prior to closing of any streets, the Contractor shall notify and obtain the approval of responsible authorities and Owner.

B. The Contractor shall sequence and plan construction operations and shall generally conduct his Work in such a manner as not to unduly or unnecessarily restrict or impede existing normal traffic through the streets of the local community.

C. Detours around construction will be subject to the approval of the authority having jurisdiction and Owner. Where detours are permitted, the Contractor shall provide all necessary barricades and signs as required to divert the flow of traffic. The Contractor shall expedite construction operations while traffic is detoured. Time periods when traffic is being detoured will be established by Owner or prevailing authority.

D. It shall be the sole responsibility of the Contractor to take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist or police protection provided for traffic while work is in progress. The Contractor shall be fully responsible for damage or injuries whether or not police protection has been provided.

E. The Contractor shall be responsible for coordination and notification of all police, fire, emergency and rescue agencies, US Postal Service, school bus stops and routes, public bus stops and routes, garbage and recycle collection and others as dictated by the Owner.

F. Contractor shall schedule a meeting with Orange County Traffic Engineer, 407-836-7900, prior to the pre-construction meeting with Orange County Utilities.

END OF SECTION

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SECTION 01560
EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary to protect the Work and prevent sedimentation from the Contractor's activities from entering water bodies or enter other parts of the County's or other property owners sites outside the Construction limits.

B. Temporary erosion controls include, but are not limited to; grassing, mulching, netting, watering and reseeding on-site surfaces and soil and borrow area surfaces, and providing interceptor ditches at end of berms and at those locations which will ensure that erosion during Construction will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.

C. Temporary sedimentation controls include, but are not limited to; silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.

1.02 REQUIREMENTS

A. The Contractor is responsible for providing effective temporary erosion and sediment control measures during Construction or until final controls become effective.

B. The Contractor shall be responsible for filing Notice of Intent for Construction Activities with regulatory agencies (SJRWMD, SFWMD, and FDEP) as required by law, if thresholds are expected to be exceeded.

C. The areas of unstabilized soil cover shall be minimized at all times to limit erosion and sedimentation.

1.03 SUBMITTALS:

A. The Contractor shall prepare and submit an Erosion and Sedimentation Control Plan (Stormwater Pollution Prevention Plan) for County review and approval. The Plan shall be in effect throughout the Construction duration.

PART 2 - PRODUCTS

2.01 EROSION CONTROL

A. Seed: Scarified Argentine Bahia.

B. Sod: Bermuda grass, Argentine Bahia grass, Pensacola Bahia grass or St. Augustine. Grassing and Sodding Materials: As specified in Section 981 FDOT Specification for Road & Bridge Construction.

C. Netting: Polypropylene mesh netting 5/8-inch x 3/4-inch (16 x 19mm) mesh with interwoven curlex fibers as manufactured by American Excelsior Company or equal. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road & Bridge Construction.

2.02 SEDIMENTATION CONTROL

A. Bales: Clean, synthetic hay type. Minimum dimensions of 14-inch by 18-inch by 36-inches at the time of placement.

B. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road & Bridge Construction.

C. Sediment Control Fencing (Silt Fencing): As manufactured by American Excelsior Company or equal.

D. Filter stone: Crushed stone conforming to Florida Department of Transportation Specifications.

E. Concrete block: Hollow, non-load bearing type.

F. Concrete: Exterior grade not less than 1-inch thick.

G. Turbidity Barriers: Floating or staked as required.

PART 3 - EXECUTION

3.01 TEMPORARY EROSION CONTROL

A. See Section 02578 "Solid Sodding."

3.02 SEDIMENTATION CONTROL

A. Install and maintain silt fences and dams, traps, barriers, and appurtenances as shown on the approved descriptions and working Drawings. Replace deteriorated hay bales and dislodged filter stone. Repair portions of any devices damaged at no additional expense to the County.

B. Install all sediment control devices in a timely manner to ensure the control of sediment. At sites where exposure to sensitive areas is likely, complete installation of all sediment control devices before starting earthwork.

C. Use approved temporary erosion control features to correct conditions that develop during Construction that were not foreseen when the Erosion and Sedimentation Control Plan was first approved.

3.03 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results that comply with the requirements of the Regulatory agency having jurisdiction, the County or the Professional, the Contractor shall immediately take whatever steps necessary to correct the deficiency at its own expense to protect the Work and any adjacent property to the site, as well as to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal or other water impoundments.

B. The side slope areas with unstabilized or unprotected soil cover shall be minimized at all times to limit erosion and sedimentation.

C. Incorporate permanent erosion control features into the Project at the earliest practical time.

D. Remove temporary erosion and sedimentation controls when the Work is complete and in accordance with the Erosion and Sedimentation Control Plan (Stormwater Pollution Prevention Plan) and the Notice of Intent for Construction Activities filed with regulatory agencies.

3.04 MAINTENANCE OF EROSION AND CONTROL FEATURES

A. Provide routine maintenance of permanent and temporary erosion control features, at no expense to the County, until the Project is complete and accepted.

END OF SECTION

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SECTION 01610
DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the Work.

B. Deliver, handle and store products in accordance with manufacturer's recommendations and by methods and means that will prevent damage, deterioration, and loss including theft and protect against damage from climatic conditions. Control delivery schedules to minimize long-term storage of products at the site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss. Damaged or defective items, in the opinion of the County, will be replaced at no cost to the County.

1.02 REQUIREMENTS

A. The Contractor is responsible for all material, equipment and supplies sold and delivered to the County under this Contract until final inspection of the Work and acceptance thereof by the County.

B. All materials and equipment to be incorporated in the Work will be handled and stored by the Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.

C. All materials and equipment, which in the opinion of the County, have become so damaged as to be unfit for the use intended or specified, will be promptly removed from the site of the Work, and the Contractor will receive no compensation for the damaged materials or equipment or for its removal.

D. In the event any such material, equipment and supplies are lost, stolen, damaged or destroyed prior to final inspection and acceptance, the Contractor will replace same without additional cost to the County.

1.03 DELIVERY

A. Transport and handle items in accordance with manufacturer's instructions.

B. The County and the Contractor's project superintendent must be on-site to accept all deliveries shipped directly to the job site. If the project superintendent is not present for a delivery, that delivery may be rejected by the County. If any delivery is rejected

due to non-availability of the Contractor's project superintendent, delivery shall be rescheduled at no additional cost to the County.

C. Schedule delivery to reduce long-term on-site storage prior to installation and/or operation. Under no circumstances will materials or equipment be delivered to the site more than 1-month prior to installation without written authorization from the County.

D. Coordinate deliveries in order to avoid delay in, or impediment of, the progress of the Work.

E. Schedule deliveries to the site not more than 1-month prior to scheduled installation without written authorization from the County.

F. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.

G. All items delivered to the site will be unloaded and placed in a manner that will not hamper the Contractor's normal construction operation or those of Subcontractors and other Contractors and will not interfere with the flow of necessary traffic.

H. Deliver products in undamaged condition, in manufacturer’s original containers or packaging, with identifying labels intact and legible. Maintain packaged materials with seals unbroken and labels intact until time of use.

I. Immediately on delivery, inspect shipments with the County to ensure compliance with requirements of Contract Documents and accepted submittals, and that products are properly protected and undamaged. If the Contractor does not notify the County regarding the delivery and the County rejects any part of the delivery, there will be no additional cost to the County for the material to be returned. For items furnished by others (i.e. County), perform inspection in the presence of the County. Provide written notification to the County of any problems.

J. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the County.

1.04 STORAGE AND HANDLING

A. Provide equipment and personnel to handle products by methods recommended by the manufacturer to prevent soiling or damage to products or packaging, with seals and labels intact and legible.

B. The Contractor is responsible for securing a location for on-site storage of all material and equipment necessary for completion of the Work. The location and storage layout will be submitted to the County at the Pre-Construction conference.

C. Manufacturer's storage instructions will be carefully studied by the Contractor and reviewed with the County. These instructions will be carefully followed and a written record of this kept by the Contractor.

D. All material delivered to the job site will be protected from dirt, dust, dampness, water, and any other condition detrimental to the life of the material from the date of delivery to the time of installation of the material and acceptance by the County.

E. When required or recommended by the manufacturer, the Contractor will furnish a covered, weather protected storage structure providing a clean, dry, non-corrosive environment for all mechanical equipment valves, architectural items, electrical and instrumentation equipment, and special equipment to be incorporated into this Project.

F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.

G. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within 7-days after written notice to do so has been given, the County retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from the Contract Amount. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

1.05 SPECIFIC STORAGE AND HANDLING

(Additional specific storage and handling requirements may be found in the specification sections addressing the material requirements.)

A. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) will be stored in a weather tight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the County. The building will be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.

1. All equipment will be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer. Mechanical equipment to be used in the Work, if stored for longer than 90-days, will have the bearings cleaned, flushed and lubricated prior to testing and startup, at no extra cost to the County.

2. Moving parts will 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 will start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

3. Lubricants will be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants will be put into the equipment at the time of acceptance. Prior to acceptance of the equipment, the Contractor will 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 will 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 will be judged to be defective. It will be removed and replaced at the Contractor's expense.

4. Electric motors provided with heaters will be temporarily wired for continuous heating during storage. Upon installation of the equipment, the Contractor will start the equipment, at least half load, and once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.

B. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

C. Cement and lime will be stored under a roof and off the ground and will be kept completely dry at all times.

D. Brick, block and similar masonry products will be handled and stored in a manner to minimize breakage, chipping, cracking and spilling to a minimum.

E. Precast Concrete will be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking.

F. All structural and miscellaneous steel and reinforcing steel will 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 will be stored with the webs vertical.

G. Metals will be stored dry, all under cover and vented to prevent build-up of humidity, all off ground to provide air circulation.

H. Lumber will be stacked to provide air circulation. Store materials for which maximum moisture content is specified in an area where moisture content can be maintained.

I. Gypsum wallboard systems will be stored to protect all metal studs, furring, insulation boards, batts, accessories and gypsum board to prevent any type of damage to these materials. Rusted material components, damp or wet insulation or gypsum boards will not be accepted.

J. Acoustical materials will be delivered to the job site in unbroken containers labeled and clearly marked. Materials will not be removed from containers until ready to install, but will be stored in dry area with cartons neatly stacked. Before installation, acoustical board will be stored for not less than 24-hours in the Work area at the same temperature and relative humidity.

K. Linear items will be stored in dry area with spacers to provide ventilation. Stack linear items to prevent warping, complying with manufacturer’s instructions.

L. Paints and other volatile materials will be stored within approved safety containers. No glass jugs will be permitted. Storage areas will be equipped with not less than 2 fire extinguishers (C02 type) sufficient to discharge a distance of 25-feet when fully charged and have current tags. No other building materials will be stored in this area. Used rags will be removed daily. Clean rags will be stored in metal closed containers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

A. The term "Project Closeout" is defined to include requirements near the end of the Contract Time, in preparation for Substantial Completion acceptance, occupancy by the County, release of retainage, final acceptance, final payment, and similar actions evidencing completion of the Work. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout may be either a single period for the entire Work or a series of time periods for individual elements of Work that has been certified as substantially complete at different dates. This time variation, if any, will be applicable to the other provisions of this section.

1.02 SCOPE OF WORK

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Final Cleaning
2. Substantial Completion
3. Final Acceptance

1.03 RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

C. Section 01720 "Project Record Documents"

D. Section 01740 "Warranties and Bonds"

1.04 PREREQUISITES FOR SUBSTANTIAL COMPLETION.

A. When the Contractor considers the Work as substantially complete, submit to the County a written notice stating so and requesting an inspection to determine the status of completion. The Contractor will attach to the notice a list of items known to be incomplete or yet to be corrected. Complete the following before requesting the County’s inspection for certification of substantial completion.

B. In the progress payment request that coincides with or is the first request following, the date substantial completion is claimed, show 100% completion or list incomplete items, the value of incomplete Work, and reasons for the Work being incomplete. Inspection procedures include supporting documentation for completion as indicated in these Contract Documents.

C. Submit a statement showing an accounting of changes to the Contract Sum.

D. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents in accordance with Section 01740 "Warranties and Bonds."

E. Obtain and submit lien releases enabling the County's full, unrestricted use of the Work and access to services and utilities.

F. Consult with County before submitting Record Documents in accordance with Section 01720 "Project Record Documents."

G. Submit Operation and Maintenance Manuals.

H. Make final changeover of permanent locks. Submit keys and keying schedule.

I. Deliver tools, spare parts, extra stock, and similar items.

J. Complete final cleaning requirements necessary for Substantial Completion.

1.05 FINAL CLEANING.

Complete the following cleaning operations prior to Substantial Completion or Owner occupancy.

A. Remove from job site all tools, surplus materials, construction equipment, storage sheds, debris, waste and temporary services.

B. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Structures:

1. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.

2. Remove all traces of splashed materials from adjacent surfaces.

3. Ensure exterior surfaces have a uniform degree of cleanliness.

4. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.

5. Remove paint droppings, spots, stains and dirt from finished surfaces.

6. Remove labels that are not permanent labels.

7. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

8. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean.

9. Wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean light fixtures and lamps.

10. Clean permanent filters of ventilating systems and replace disposable filters if units were operated during construction. Clean ducts, blowers and coils if units were operated without filters during construction.

1.06 OPERATION AND MAINTENANCE MANUALS

A. The Contractor will submit the proposed format, content and tab structure for all Operating and Maintenance Manuals for the County's review and approval. The tab structure for Operating and Maintenance Manuals will follow specification division format as accepted by the Construction Specification Institute. After the County approves the proposed format, content, and tab structure for the Operating and Maintenance Manuals, the Contractor will create and deliver 5 complete sets.

B. Operation and Maintenance documentation is required for each piece of mechanical, electrical, communications, instrumentation and controls, pneumatic, hydraulic, conveyance, and special construction. If required by the technical specifications, provide Operation and Maintenance documentation for any other product not listed in the foregoing.

C. The requirements of this Section are separate, distinct and in addition to product submittal requirements that may be established by other Sections of the Specifications. Owner's manuals, manufacturer's printed instructions, parts lists, test data and other submittals required by other Sections of the Specifications may be included in the Operating and Maintenance Manuals provided that they are approved and are formatted in a manner consistent with the requirements of this Section.

D. Deliver Operation and Maintenance Manuals directly to the County.

E. Operating and Maintenance Manual documents must include, but are not limited to, table of contents, approved submittals, manufacturer's operating and maintenance instructions, brochures, Shop Drawings, performance curves and data sheets annotated to indicate equipment actually furnished (e.g. identifying impeller size, model, horsepower, etc), procedures, wiring and control diagrams, records of factory and field tests and device/controller settings and calibration, program lists or data compact discs, maintenance and warranty terms and contact information, spare parts

listings, inspection procedures, emergency instructions, and other Operating and Maintenance documentation that may be useful to the County. The material and equipment data required by this Section must include all data necessary for the proper installation, removal, normal operation, emergency operation, startup, shutdown, maintenance, cleaning, adjustment, calibration, lubrication, assembly, disassembly, repair, inspection, trouble-shooting, and warranty service of the equipment or materials.

F. The Contractor must bind the Operating and Maintenance Manual documents in heavy-duty, 3-ring vinyl-covered binders including pocket folders for folded sheet information. Mark binder identification on both the front and spine of each binder. Binder information must list the project title, identify separate structures or locations as applicable, identify the general subject matter covered in the manual and must include the words "OPERATING AND MAINTENANCE INSTRUCTIONS".

1. The Contractor must submit the Operating and Maintenance documents on three-hole punched, 8-1/2-inch x 11-inch sheets or on three-hole punched sheets that are foldable in multiples of 8-1/2-inch x 11-inch. The three-hole punched edge will be the left 11-inch edge.

2. The Contractor may request waivers to the size requirement for specific instances. The Contractor's waiver request must be in writing to the County. The Contractor's waiver request must include a justification for seeking the waiver.

G. The Contractor must provide an electronic version of the complete and final Operating and Maintenance Manuals in original electronic file format on compact disc or DVD. The Contractor must also provide one (1) electronic pdf file of each bound Operating and Maintenance Manual that represents each Manual’s content. The electronic pdf file must match the Operating and Maintenance Manual content and organizational structure.

1.07 SUBSTANTIAL COMPLETION INSPECTION PROCEDURES

A. Upon receipt of the Contractor's request for inspection, the County will either proceed with inspection or advise the Contractor of incomplete prerequisites.

B. Following the initial inspection, the County will either prepare the certificate of Substantial Completion, or advise the Contractor of Work which must be performed before the certificate will be issued. The County will repeat the inspection when requested in writing and when assured that the Work has been substantially completed.

C. Results of the completed inspection will form the initial "punch list" for final acceptance.

1.08 PREREQUISITES FOR FINAL ACCEPTANCE.

A. Complete the following before requesting the County's final inspection for certification of final acceptance, and final payment. List known exceptions, if any, in the request.

B. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates for insurance for products and completed operations where required.

C. Submit written certification that:

1. The County's final punch list of itemized Work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

2. The Contract Documents have been reviewed and Work has been completed in accordance with Contract Documents.

3. Equipment and systems have been tested in the presence of the County and are operational.

4. Work is completed and ready for final inspection.

D. Submit consent of surety.

E. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.09 FINAL ACCEPTANCE INSPECTION PROCEDURES

A. The County will re-inspect the Work upon receipt of the Contractor's written notice that the Work, including punch list items resulting from earlier inspections, has been completed, except for those items for which completion has been delayed because of circumstances that are acceptable to the County.

B. Upon completion of re-inspection, the County will either prepare a certificate of final acceptance or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled, which are required for final acceptance.

C. If necessary, the re-inspection procedure will be repeated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The purpose of the Project Record Documents is to provide the County with factual information regarding all aspects of the Work, both concealed and visible, to enable future location, identification and modification of the Work without lengthy and expensive site measurement, investigation or examination.

B. These standards and procedures are for integration of digital engineering CAD drawings and attribute data into the database environments, while maintaining the integrity and positional accuracy of the data. The requirement for digital submittal of approved construction plans is to provide the County GIS with a parcel and utility base for field maintenance and operations.

C. The location of the constructed improvements as depicted in the Contract Drawings is required. To insure the Work was constructed in conformance with the Contract Drawings, the following survey documents are required to be prepared and certified by the Surveyor:

1. As-Built Asset Attribute Data Table (see Table 01050-2)

2. Boundary Survey and Survey Map Report for pump stations and easements with constructed improvements.

1.02 DEFINITIONS

A. Except where specific definitions are used within a specific section, the following terms, phrases, words and their derivation shall have the meaning given herein when consistent with the context in which they are used. Words used in the present tense include the future tense, words in the plural number include the singular number and words in the singular number include the plural number.

B. As-Built Drawings: Drawings prepared by the Contractor's Surveyor shall depict the actual location of installed utilities for the completed Work in a full size hard copy and an electronic AutoCAD file (dwg) format.

C. Record Documents: All documents as required in subsections 1.04 and 2.02 in this specification section.

D. Boundary Survey: Boundary survey, map and report certified by a Surveyor shall be provided that meets the requirements of Chapter 5J-17 'Minimum Technical Standards', FAC.

E. Surveyor: Contractor's Surveyor that is licensed by the State of Florida as a Professional Surveyor and Mapper pursuant to Chapter 472, F.S.

F. Survey Map Report: As a minimum the Survey Map Report shall identify any corners that had to be reset, measurements and computations made, pump station and easement boundary issues, locations of constructed improvements outside boundaries, and accuracies obtained.

1.03 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of the Record Documents to one person on the Contractor's staff as approved by the County.

B. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of specifications and each sheet of Drawings and other documents where such entry is required to show progress and changes properly.

C. Make entries within 24-hours after receipt of information has occurred.

1.04 RECORD DOCUMENTS AT SITE

A. Maintain at the site and always available for County’s use one (1) record copy of:

1. Construction Contract, Drawings, Specifications, General Conditions, Supplemental Conditions, Bid Proposal, Instruction to Bidders, Addenda, and all other Contract Documents
2. Change Orders, Verbal Orders, and other modifications to Contract
3. Written instructions by the County as well as correspondence related to Requests for Information (RFIs)
4. Accepted Shop Drawings, Samples, product data, substitution and "or-equal" requests
5. Field test records, inspection certificates, manufacturer certificates and construction photographs
6. Progressive As-Built Drawings
7. Current Surveyor’s tables for the As-Built Assets Attribute Data.

B. Maintain the documents in an organized, clean, dry, legible condition and completely protected from deterioration and from loss and damage until completion of the Work, transfer of all record data to the final As-built Drawings for submittal to the County.

C. Store As-Built Documents and samples in Contractor's office apart from documents used for construction. Do not use As-Built document for construction purposes. Label each document "AS-BUILT" in neat large printed letters. File documents and samples in accordance with CSI/CSC format.

D. Record information concurrently with construction progress. Do not conceal any Work until required information is recorded.

PART 2 - PRODUCTS

2.01 AS-BUILT DRAWINGS

A. Maintain the electronic As-Built Drawings to accurately record progress of Work and change orders throughout the duration of the Contract.

B. Date all entries. Enter RFI No., Change Order No., etc. when applicable.

C. Call attention to the entry by highlighting with a "cloud" drawn around the area affected.

D. In the event of overlapping changes, use different colors for entries of the overlapping changes.

E. Design call-outs shall have a thin strike line through the design call-out and all As-Built information must be labeled (or abbreviated "AB") and be shown in a bolder text that is completely legible.

F. Make entries in the pertinent other documents while coordinating with the County for validity.

G. Entries shall consist of graphical representations, plan view and profiles, written comments, dimensions, State Plane Coordinates, details and any other information as required to document field and other changes of the actual Work completed. As a minimum, make entries to also record:

1. Depths of various elements of foundation in relation to finish floor datum and State Plane Coordinates and elevations.

2. As-Built Asset Attribute Data Table shall be completed in the Drawings.

3. When electrical boxes, or underground conduits and plumbing are involved as part of the Work, record true elevations and locations, dimensions between boxes.

4. Actually installed pipe or other work materials, class, pressure-rating, diameter, size, specifications, etc. Similar information for other encountered underground utilities, not installed by Contractor, their owner and actual location if different than shown in the Contract Documents.

5. Details, not on original Contract Drawings, as needed to show the actual location of the Work completed in a manner that allows the County to find it in the future.

6. The Contractor shall mark all arrangements of conduits, circuits, piping, ducts and similar items shown schematically on the construction documents and

show on the As-Built Drawings the actual horizontal and vertical alignments and locations.

7. Major architectural and structural changes including relocation of doors, windows, etc. Architectural schedule changes according to Contractor's records and Shop Drawings.

2.02 RECORD DOCUMENTS

A. Three (3) hard copy sets and three (3) digital media sets of the final Record Documents and shall include all of the documents described below under this subsection 2.02.

B. The following documents shall be signed and sealed by the Surveyor:

1. As-Built Asset Attribute Data Table (see Specification Section 01050 "Surveying and Field Engineering," Table 01050-2 for an example)

2. Boundary Survey of pump station and Survey Map Report

3. Boundary Survey and Survey Map Report for the location of constructed pipes within any easements and right-of-way. As a minimum the Survey Map Report shall identify or describe the locations where the pipe centerline was constructed within 3- feet of the easement or right-of-way boundary, where the pipe was constructed outside the easement or right-of-way boundary, any corners that had to be reset, measurements and computations made, pump station boundary issues, and accuracies obtained. Survey map report shall be dated after the Work within the right-of-ways or easements have been completed.

C. Digital sets of the final Record Documents including but not limited to:

1. Scanned digital copies of the final As-Built Drawings

2. Electronic Survey documents electronically sealed by the Surveyor

3. Final Record Documents information

4. Digital As-Built Drawing in the Engineer's current version of AutoCAD file (dwg) format for the Contract Drawings, updated to match the final Record Drawing information

D. Pump station site Boundary Survey and Map Report.

E. New Boundary Survey to re-establish easement corners, right-of-way monuments, or pump station site corners with monuments if destroyed by the Work.

F. Scanned Documents: Scan the Survey Documents and other Record Documents reflecting changes from the Bid Documents.

G. The scanned "As-Built" Drawing sets shall be complete and include the title sheet, plan/profile sheets, cross-sections, and details. Each individual sheet contained in the

printed set of the As-Built Drawings shall be included in the electronic drawings, with each sheet being converted into an individual tif (tagged image file). The plan sheets shall be scanned in tif format Group 4 at minimum of 400 dpi resolution to maintain legibility of each drawing. Then, the tif images shall be embedded into a single pdf (Adobe Acrobat) file representing the complete plan set. Review all Record Documents to ensure a complete record of the Project.

H. Provide an encompassing digital AutoCAD file that includes all the information of the As-Built Drawings and any other graphical information in the As-Built Drawings. It shall include the overall Work, utility system layout and associated parcel boundaries and easements. Feature point, line and polygon information for new or altered Work and all accompanying geodetic control and survey data shall be included. The surveyor's certified As-Built Asset Attribute Data shall be added to the As-Built Drawings and Surveyor shall electronically seal the data in a comma-delineated ASCII format (txt).

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. Pre-construction Meeting: It is recommended that the Surveyor attend the Pre-construction meeting. At the pre-construction meeting the Contractor shall be provided with a blank electronic version of the spreadsheet for the tables: Asset Attribute Data and Pipe Deflection. The Contractor's surveyor shall use these tables to input the data and shall not alter the table format or formulas.

3.02 CONSTRUCTION PROGRESS MEETINGS

A. Contractor shall provide progressive Record Documents described below:

1. Construction Contract, As-Built Drawings, Specifications, General Conditions, Supplemental Conditions, Bid Proposal, Instruction to Bidders, Addenda, and all other Contract Documents.

2. Specifications and Addenda: Record manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed as well as any changes made by Field Order, Change Order or other.

3. Change orders, verbal orders, and other modifications to Contract.

4. Written instructions by the County as well as correspondence related to Requests for Information (RFIs).

5. Accepted Shop Drawings, samples, product data, substitution and "or-equal" requests.

6. Field test records, inspection certificates, manufacturer certificates and construction photographs.

7. As-Built Asset Attribute Data Table: Surveyor shall obtain field measurements of vertical and horizontal dimensions of constructed improvements. The monthly submittal shall include the Surveyor's certified statement regarding the constructed improvements being within the specified accuracies as described in Specification Section 01050 "Surveying and Field Engineering", Table 01050-1 Minimum Survey Accuracies or if not, indicating the variances.

3.03 FINAL RECORD DOCUMENTS SUBMITTAL

A. Submit the Final Record Documents within 20-days after Substantial Completion.

1. Participate in review meetings as required and make required changes and promptly deliver the Final Record Documents to the County.

3.04 STORAGE AND PRESERVATION

A. Store Record Documents and samples at a protected location in the project field office apart from documents used for construction.

1. Provide files and racks for storage of documents

2. Provide locked cabinet or secure space for storage of samples

B. File documents and samples in accordance with CSI format with section numbers matching those in the Contract Documents.

C. In the event of loss of recorded data, use means necessary to again secure the data to the County's approval.

1. Such means shall include, if necessary in the opinion of the County, removal and replacement of concealing materials.

2. In such cases, provide replacements of the concealing materials to the standards originally required by the Contract Documents.

END OF SECTION

SECTION 01740
WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.02 RELATED WORK

A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.

B. General closeout requirements are included in Section 01700 "Project Closeout."

C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Division 2 through 16.

1.03 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the County.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the County.

1.04 SUBMITTALS

A. Submit written warranties to the County prior to requesting a Substantial Completion Inspection as outlined in Section 01700 "Project Closeout." If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the County.

B. When a designated portion of the Work is completed and occupied or used by the County, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the County within 15-days of completion of that designated portion of the Work.

C. When a special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier or manufacturer, prepare a written document

that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the County for approval prior to final execution.

D. Refer to individual Sections of Divisions 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

E. Prior to Substantial Completion Inspection, submit to the County two (2) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, Subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-inch by 11-inch three-hole punched paper.

2. Table of Contents will be neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified and the name of the product or work item.

3. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer, supplier and manufacturer.

4. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name and the name, address and telephone number of the Contractor.

5. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.05 WARRANTY REQUIREMENT

A. The Contractor will warrant all equipment in the Contractor's one-year warranty period even though certificates of warranty may not be required. For all major pieces of equipment, the Contractor shall submit a warranty from the equipment manufacturer. "Major" equipment is defined as a device having a 5 HP or larger motor or which lists for more than $1,000.00.

B. In the event that an equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at Substantial Completion, the Contractor will obtain from the manufacturer a warranty of sufficient length commencing at the time of equipment delivery to the job site, such that the warranty will extend to at least 1-year past substantial completion.

C. If an individual specification section requires a particular warranty more stringent than that required by this Section or the General Conditions, the more stringent requirements will govern for the applicable portion of the Work.

D. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty will be equal to the original warranty with an equitable adjustment for depreciation.

F. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the County has benefited from use of the Work through a portion of its anticipated useful service life.

G. County's Recourse: Written warranties made to the County are in addition to implied warranties, and will not limit the duties, obligations, rights and remedies otherwise available under the law, nor will warranty periods be interpreted as limitations on time in which the County can enforce such other duties, obligations, rights, or remedies.

H. Rejection of Warranties: The County reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

I. The County reserves the right to refuse to accept Work for the project where a special warranty, certification, or similar commitment is required on such work or part of the Work, until evidence is presented that entities required to counter-sign such commitments are willing to do so.

J. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DELIVERABLES

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and Subcontractors, and bind into a

commercial quality standard 3-ring binder; submit 5 copies of the warranties and bonds to the County for review.

1. The warranties and bonds shall include:

   a. Equipment or product description
   b. Manufacturer's name, principal, address and telephone number
   c. Contractor, name of responsible principal, address and telephone number
   d. Local supplier's or representatives name and address
   e. Scope of warranty or bond
   f. Proper procedure in case of failure
   g. Instances which might affect the validity of warranty or bond
   h. Date of beginning of warranty, bond or service and maintenance contract
   i. Duration of warranty, bond or service maintenance contract

B. Warranties

1. Furnish an extended warranty for sanitary sewer main liner certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for 1-year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner acceptable to the County.

2. Furnish an extended warranty for sanitary lateral liner certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for 1-year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner acceptable to the County.

END OF SECTION

SECTION 02050
DEMOLITION OF EXISTING STRUCTURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. This Section specifies the labor, materials, equipment, and incidentals required for the demolition, relocation, and/or disposal of all structures, building materials, equipment, and accessories to be removed as shown on the Drawings and as specified herein.

2. There may be existing and active stormwater, wastewater, water, and other facilities on site as indicated on the Drawings. It is essential that these facilities, when encountered, remain intact and in service during the proposed demolition. Consequently, the Contractor shall be responsible for the protection of these facilities and shall diligently direct all his activities toward maintaining continuous operation of the existing facilities and minimizing operational inconvenience.

3. Demolition generally includes:

   a. Complete demolition and removal of the existing 6’ chain link fence and return to the Owner in rolls (The site must remain secured during the duration of the project); remove the existing 16’ wide 8’panel swing gate and return to the Owner; remove a portion of the concrete drive; modify or replace the HDPE piping, fittings, and pipe support as shown on the drawings. Work as shown on the Drawings and specified herein.

   b. All material, equipment, rubble, debris, and other products of the demolition shall become the property of the Contractor for his disposal off-site in accordance with all applicable laws and ordinances at the Contractor's expense. The sale of salvageable materials by the Contractor shall only be conducted off-site. The sale of removed items on the site is prohibited by the County.

4. The Contractor shall examine the various Drawings, visit the site, determine the extent of the Work, the extent of work affected therein, and all conditions under which he is required to perform the various operations.

5. The Contractor shall fill and compact all voids left by the removal of pipe, structures, etc. with materials described herein to a grade that will provide for positive drainage of the disturbed area to drain run-off in direction consistent

with the surrounding area. The Contractor shall provide all fill materials to the site as needed. Compaction of fill shall match the compaction of adjacent undisturbed material.

1.02 QUALITY ASSURANCE

A. Permits and Licenses: Contractor shall obtain all necessary permits and licenses for performing the Work and shall furnish a copy of same to the County prior to commencing the Work. The Contractor shall comply with the requirements of the permits.

B. Notices: Contractor shall issue written notices of planned demolition to companies or local authorities owning utility conduit, wires, or pipes running to or through the project site. Copies of said notices shall be submitted to the County.

C. Utility Services: Contractor shall notify utility companies or local authorities furnishing gas, water, electrical, telephone, or sewer service to remove any equipment in the structures to be demolished and to remove, disconnect, cap, or plug their services to facilitate demolition.

D. Contractor shall notify the Orange County Risk Management Department in writing prior to beginning any demolition work.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. Submit to the County for their approval, 2 copies of proposed methods and operations of demolition or relocation of the structures specified below prior to the start of Work. Include in the schedule the coordination of shut-off, capping, and continuation of utility service as required.

C. Provide a detailed sequence of demolition and removal work to ensure the uninterrupted progress of the County's operations.

D. Before commencing demolition work, all structure relocation, bypassing, capping, or modifications necessary will be completed. Actual work will not begin until the County has inspected and approved the prerequisite work and authorized commencement of the demolition work.

E. The above procedure must be followed for each individual demolition operation.

1.04 SITE CONDITIONS

A. Prior to demolition, the Contractor shall obtain written verification from the utility owner(s) that the existing utilities, including stormwater, wastewater, and/or water facilities, are not operational and are ready for demolition.

B. The County assumes no responsibility for the actual condition of the structures to be demolished or relocated.

C. Conditions existing at the time of inspection for bidding purposes will be maintained by the County insofar as practicable. However, variations within each site may occur prior to the start of demolition work.

D. No additional payment will be made for pumping or other difficulties encountered due to water.

E. Certain information regarding the reputed presence, size, character and location of existing underground structures, pipes and conduit has been shown on the Drawings. There is no certainty of the accuracy of this information, and the location of underground structures shown may be inaccurate and other obstructions than those shown may be encountered. The Contractor hereby distinctly agrees that the County is not responsible for the correctness or sufficiency of the information given; that in no event is this information to be considered as a part of the Contract; that he shall have no claim for delay or extra compensation on account of incorrectness of information regarding obstructions either revealed or not revealed by the Drawings; and that he shall have no claim for relief from any obligation or responsibility under this Contract in case the location, size, or character of any pipe or other underground structure is not as indicated on the Drawings, or in case any pipe or other underground structure is encountered that is not shown on the Drawings.

1.05 RESTRICTIONS

A. No building, tank or structure, or any part thereof, shall be demolished until an application has been filed by the Contractor with the Building Department Inspector and a permit issued if a permit is required. The fee for this permit shall be the Contractor's responsibility. Demolition shall be in accordance with applicable provisions of the Building Code of the State of Florida.

B. No explosives shall be used at any time during the demolition. No burning of combustible material will be allowed.

C. Contractor shall notify the Orange County Risk Management Department prior to beginning any demolition work.

1.06 DISPOSAL OF MATERIAL

A. All salvageable or useable material or equipment to be retained by the County shall be shown on Drawings, and shall be moved to a designated area by Contractor for pick up by County. The Contractor shall promptly remove all other materials from the site as indicated or shown on the Drawings.

B. All materials not retained by the County shall become the Contractor's property and shall be removed off-site.

C. The on-site storage of removed items is prohibited by the County. Off-site sale of salvageable material by the Contractor is acceptable.

1.07 TRAFFIC AND ACCESS

A. Site access and staging is limited to only in the location south of the pump station and inside the pump station. The Contractor shall maintain access to the pump wet well, and in the event of an emergency allow access to Orange County personnel.

B. Conduct work to ensure minimum interference with on-site and off-site roads, streets, sidewalks, and occupied or used facilities.

C. Special attention is directed towards maintaining safe and convenient access to the existing facilities remaining in operation by plant personnel and plant associated vehicles, including trucks and delivery vehicles.

D. Do not close or obstruct streets, sidewalks, or other occupied or used facilities without permission from the County. Provide alternate routes around closed or obstructed traffic in access ways.

1.08 PROTECTION

A. Conduct operations to minimize damage by falling debris or other causes to adjacent buildings, structures, roadways, other facilities, and persons. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain.

1.09 DAMAGE

A. Promptly repair damage caused to adjacent facilities by demolition operations as directed by the County at no cost to the County.

1.10 UTILITIES

A. Maintain existing utilities as directed by the County to remain in service and protect against damage during demolition operations.

B. Do not interrupt existing utilities serving occupied or operational facilities, except when authorized by County. Provide temporary services during interruptions to existing utilities as acceptable to the County.

C. The Contractor shall cooperate with the County to shut off utilities serving structures of the existing facilities as required by demolition operations.

D. The Contractor shall be solely responsible for making all necessary arrangements and for performing any necessary work involved in connection with the interruption of all public and private utilities or services.

E. All utilities being abandoned shall be terminated at the service mains in conformance with the requirement of the utility companies or the municipality owning or controlling them.

1.11 EXTERMINATION

A. If required, before starting demolition, the Contractor shall employ a certified rodent and vermin exterminator and treat the facilities in accordance with governing health laws and regulations. Any rodents, insects, or other vermin appearing before or during the demolition shall be killed or otherwise prevented from leaving the immediate vicinity of the demolition work.

1.12 POLLUTION CONTROL

A. For pollution control, use water sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust rising and scattering in the air to the lowest level of air pollution practical for the conditions of work. The Contractor shall comply with the governing regulations.

B. Clean adjacent structures and improvements of all dust and debris caused by demolition operations as directed by the County. Return areas to conditions existing prior to the start of Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

1.01 SEQUENCE OF WORK

A. The sequence of demolition and relocation of existing facilities shall be in accordance with the approved critical path schedule as specified in paragraph 1.03 above and specification Section 01001, in paragraph 1.05.

1.02 REMOVAL OF EXISTING PROCESS EQUIPMENT, PIPING, AND APPURTENANCES

A. Equipment to be retained by the County will be designated for retention by the County prior to bidding as specified in Paragraph 1.06 above. Subject to the constraints of maintaining existing facilities in operation as shown on the Drawings, all other process equipment, non-buried valving and piping, and appurtenances shall be removed from the site.

1.03 DEMOLITION PROCEDURES

The Contractor shall adhere to the following demolition procedures as referenced on the Drawings:

A. TO BE DEMOLISHED: Demolition shall be the breaking up, cutting, filling of any holes resulting, final grading of the area, performing any other operations required, and the removal from the site of all structures and equipment (structures, substructures, floor slabs, equipment, tanks, pipes, fittings, electrical systems, light poles, wiring, underground conduits and wiring, isolated slabs, and sidewalks) as indicated on the Drawings. All pieces of concrete, metal, and any other demolished material shall be removed to a depth of at least 5-feet below existing grade. Broken pieces of concrete may be size reduced by an on-site crusher, but in any event must be removed from the project site.

Before commencing structural demolition, remove all mechanical, electrical, piping, and miscellaneous appurtenances. Completely remove the structure by thoroughly breaking up concrete into pieces no more than 2-feet across the largest dimension.

B. TO BE REMOVED: Where indicated on the Drawings, the structures and equipment shall be completely removed from the site with all associated connecting piping or electrical service. The item shall be taken whole or in parts to be salvaged or disposed of by the Contractor.

C. TO BE ABANDONED: Where indicated on the Drawings, the structures and equipment shall be left in place, drained, and the contents properly disposed. The upper 4-feet of the structure shall be cut and removed, including the cover slab and access port, frame, and cover. All structures to be abandoned with bottom slabs shall be drilled (2 holes minimum, 2.0-inch diameter each) or hole punched to prevent flotation and filled with common fill.

D. PIPING TO BE REMOVED: Where indicated on the Drawings, pipe (and conduit) shall be drained and the contents properly disposed. The pipe (or conduit) shall then be completely removed from the site, including fittings, valves, and other in-line devices. Connections to existing piping to remain shall be plugged by mechanical means (M.J. plugs, tie-rods, or thrust blocks). Piping shall be removed in accordance with Specification Section 02080 "Abandonment, Removal and Salvage or Disposal of Existing Pipe."

E. PIPING TO BE ABANDONED: Where indicated on the Drawings, piping (or conduit) shall be left in place. All such piping shall be drained and the contents properly disposed. The pipe (or conduit) shall then be filled with grout (flowable fill) and each end of the pipe (or conduit) shall be plugged using a concrete plug in a manner acceptable to the County. Piping shall be abandoned in accordance with Specification Section 02080 "Abandonment, Removal and Salvage or Disposal of Existing Pipe."

F. TO BE PROTECTED: Where indicated on the Drawings, the utility service, fence, structure, tree, or device so designated shall be temporarily protected during the prosecution of the demolition work as specified in Division 1.

G. TO REMAIN: Where indicated on the Drawings, the designated facilities shall remain intact and in service during the prosecution of the demolition work.

1.04 DEWATERING OF EXISTING PROCESS UNITS AND DISPOSAL OF RESIDUE

The Contractor shall notify the County prior to beginning the dewatering work on any existing process units which contain wastewater, grit, or sludge. The Contractor, at his own expense, shall remove the entire contents of each structure and dispose off site. The proper transport and disposal of all residues shall remain the responsibility of the Contractor.

END OF SECTION

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SECTION 02100
TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work

1. The Work specified in this Section consists of designing, providing, maintaining and removing temporary erosion, sedimentation and turbidity controls as necessary.

2. Temporary erosion controls include, but are not limited to, grassing, mulching, setting, watering and reseeding on-site surfaces and soil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by federal, state and local requirements and by the County.

3. Temporary sedimentation controls include, but are not limited to; silt fence, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by federal, state and local requirements and by the County.

4. Temporary turbidity controls include, but are not limited to, floating or staked turbidity barriers which will ensure that turbidity pollution will be either eliminated or maintained within acceptable limits as established by Federal, state, and local requirements and by the County.

5. Contractor is responsible for providing effective temporary erosion, sediment, and turbidity control measures during construction or until permanent controls become effective.

B. Related Work Described Elsewhere: South Florida Building Code and Standard Building Code, FDOT Standard Specifications for road and bridge construction and FDOT Design Standards.

PART 2 - PRODUCTS

2.01 EROSION CONTROL

A. Netting Fence: fabricated of material acceptable to the County.

B. Sod is specified in Section 02578, "Solid Sodding."

2.02 SEDIMENTATION CONTROL

A. Bales: clean, seed-free cereal hay type.

B. Netting: fabricated of material acceptable to the County.

C. Concrete block: hollow, non-load bearing type.

D. Concrete: exterior grade not less than 1-inch thick.

E. Rock Bags: conforming to FDOT Specifications.

2.03 TURBIDITY CONTROL

A. Conforming to FDOT Design Standards Index 103 - Turbidity Barriers.

PART 3 - EXECUTION

3.01 EROSION CONTROL

A. Minimum Procedures for Grassing Are:

1. Scarify slopes to a depth of not less than 6-inches and remove large clods, rock, stumps and roots larger than 1/2-inch in diameter and debris.

2. Sow seed within 24-hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.

3. Apply mulch loosely and to a thickness of between 3/4-inch and 1-1/2-inches.

4. Apply netting over mulched areas on sloped surfaces.

5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

A. Install and maintain silt fence, silt dams, traps, barriers and appurtenances as shown on the approved descriptions and working Drawings. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03 TURBIDITY CONTROL

A. Install and maintain turbidity barriers daily and as described in FDOT Index #103.

3.04 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results which comply with the requirements of the State of Florida, the Contractor shall immediately take whatever steps are necessary to correct the deficiency at his own expense.

END OF SECTION

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SECTION 02140
DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: The Work to be performed under this section shall include furnishing all equipment and labor necessary to remove storm or subsurface waters from excavation areas and disposal of same in accordance with the requirements set forth, as shown on the Drawings and as stated in the respective geotechnical report if furnished under separate cover.

B. Dewatering Discharge Permit: The Contractor shall be responsible for permitting the discharge of dewatering effluent to surface water, or sanitary sewer, if needed for this project. The Contractor shall also be responsible for the sampling and testing of groundwater and dewatering effluent as necessary to meet the permit requirements and verify compliance. The Contractor shall provide the OWNER with its plan for operating the dewatering system within 10 working days after notice to proceed, including information regarding the Contractor's plans to discharge dewatering effluent, if applicable. The Contractor shall be responsible for operation of the dewatering system in a manner that allows the Contractor to obtain valid water samples for analytical testing, including control of turbidity, at the required intervals.

1.02 QUALITY ASSURANCE

A. Disposal of dewatering water is considered a means and method of the Contractor, and must be conducted in conformance with the FDEP and County environmental regulations/requirements. The Contractor will retain a private firm to provide water quality testing of dewatering effluent. The testing firm will advise the contractor where dewatering effluent may be discharged based on the results of their quality testing. Should the Contractor select to discharge that water in non-conformance with the testing firm's recommendations, the Contractor shall be solely responsible for all associated fines/actions, including reimbursement of any fines levied against the County or others.

B. Any non-contaminated dewatering effluent that is going to be discharged to a surface water body requires the "Generic Permit for the Discharge of Produced Groundwater from Any Non-Contaminated Site Activity", (Chapter 62-621.300(2), FAC). [Generic Permit]

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 DEWATERING

A. The Contractor shall provide adequate equipment for the removal of storm or subsurface waters which may accumulate in the excavation. Within and adjacent to residential areas, all pumping equipment shall be electrically powered without the use of internal combustion engines or generators associated unless approved in writing by the Owner.

B. If subsurface water is encountered, the Contractor shall utilize suitable equipment to adequately dewater the excavation so that it will be dry for work and pipe laying. A wellpoint system or other Engineer accepted dewatering method shall be utilized if necessary to maintain the excavation in a dry condition for preparation of the trench bottom and for pipe laying.

C. Dry condition shall be defined as groundwater table lowered to a minimum of one (1) foot below the proposed trench bottom or trench bottom soils within 2% optimum moisture content.

D. Dewatering by trench pumping will not be permitted if migration of fine grained natural material from bottom, side walls, or bedding material will occur.

E. In the event that satisfactory dewatering cannot be accomplished due to subsurface conditions or where dewatering could damage existing structures, the Contractor shall obtain RPR review and approval of wet trench construction or procedure before commencing construction.

F. Dewatering shall be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

G. The Contractor shall furnish all materials and equipment and perform all work required to install and maintain the drainage systems for handling groundwater and surface water encountered during construction of structures, pipelines and compacted fills.

H. The Contractor is responsible for control of turbidity and pH of the dewatering effluent, and is responsible for the implementation of controls and/or structures, or technology strategies, to maintain acceptable turbidity and pH levels of the effluent prior to discharge.

I. Continuous pumping will be required as long as water levels are required to be below natural levels.

3.02 DISPOSAL

A. Disposal of dewatering water is considered a means and method of the Contractor, and must be conducted in conformance with the FDEP and County environmental regulations/requirements. Contractor is responsible for acquiring all permits required to discharge the water and shall protect waterways from turbidity during the operation.

B. No flooding of streets, roadways, driveways or private property will be permitted. Engines driving dewatering pumps shall be equipped with residential type mufflers.

C. Responsibility for turbidity control to prevent off-site sedimentation remains with the contractor until infiltration to water table occurs, or until received by a wetland or surface water body.

D. Discharge water shall be clear, with no visible soil particles. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with the normal drainage of the area in which the work is being performed, create a public nuisance or form ponding. The operation shall not cause damage to any portion of the work completed, in progress, to the surface of streets or to private property. The dewatering operation shall comply with the requirements of National Pollutant Discharge Elimination System (NPDES) and other state and County regulatory agencies. Additionally, the Contractor shall obtain proper right of entry where private property will be involved.

END OF SECTION

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SECTION 02215
FINISH GRADING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Provide finish grading to all areas within the limits of construction.

B. Grade sub-soil. Cut out areas to receive stabilizing base course materials for paving and sidewalks. Place, finish grade, and compact topsoil.

1.02 PROTECTION

A. Prevent damage to existing fencing, trees, landscaping, natural features, benchmarks, pavement, and utility lines. Correct damage at no cost to the County.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

PART 2 - PRODUCTS

2.01 MATERIALS

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

B. Topsoil: Friable loam free from subsoil, roots, grass, excessive amount of weeds, stones, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4% and a maximum of 25% organic matter. The topsoil shall be suitable for the proposed plant growth shown on the Drawings and specified. Use topsoil stockpiles on site if conforming to these requirements. If there is not sufficient topsoil available at the project site, the Contractor shall furnish additional topsoil as required to complete the Work at no additional cost to the County.

PART 3 - EXECUTION

3.01 SUB SOIL PREPARATION

A. Rough grade sub-soil systematically to allow for a maximum amount of natural settlement and compaction. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, etc. Remove sub-soil that has been contaminated with petroleum products.

B. Cut out areas to subgrade elevation which are to receive stabilizing base for paving and sidewalks.

C. Bring sub soil to required levels, profiles, and contours. Make changes in grade gradual. Blend slopes into level areas.

D. Slope grade away from building a minimum of 2-inches in 10-feet unless indicated otherwise on the Drawings.

E. Cultivate subgrade to a depth of 3-inches where topsoil is to be placed. Repeat cultivation in areas where equipment used for hauling and spreading topsoil has compacted sub-soil.

3.02 PLACING TOPSOIL

A. Place topsoil in areas where seeding, sodding, and planting is to be performed. Place to the following minimum depths, up to finished grade elevations.

1. 6-inches for seeded areas
2. 4-1/2-inches for sodded areas
3. 24-inches for shrub beds
4. 18-inches for flower beds

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours of subgrades.

D. Remove stones, roots, grass, weeds, debris, and other foreign material while spreading.

E. Manually spread topsoil around trees, plants, and buildings to prevent damage which may be caused by grading equipment.

F. Lightly compact placed topsoil.

3.03 SURPLUS MATERIAL

A. Remove surplus sub soil and topsoil from site.

B. Leave stockpile areas and entire job site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 02220
EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Excavate, backfill, and compact as required for the construction of the utility system consisting of piping and appurtenances, and structural construction as shown on the Drawings and specified herein. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to perform all excavation, backfill, compaction, grading, and slope protection to complete the Work. The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, all under ground utilities locations and appurtenances shown on the construction Drawings.

B. Definitions:

1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material as determined by AASHTO T-180 (ASTM D155).

2. Optimum Moisture: Percentage of water in a specific material at maximum density.

3. Rock Excavation: Excavation of any hard natural substance which requires the use of explosives and/or special impact tools such as jack hammers, sledges, chisels, or similar devices specifically designed for use in cutting or breaking rock, but exclusive of trench excavating machinery.

4. Suitable: Suitable materials for fills shall be non-cohesive, non-plastic granular local sand and shall be free from vegetation, organic material, marl, silt, or muck. The Contractor shall furnish all additional fill material required.

5. Unsuitable: Unsuitable materials are highly organic soil (peat or muck) classified as A-8 in accordance with AASHTO Designation M 145.

C. Plan For Earthwork: The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the conformation of the ground, the character and quality of the substrata, the types and quantities of materials to be encountered, the nature of the groundwater conditions, the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. Prior to commencing the excavation, the Contractor shall submit a plan of his proposed operations, including maintenance of traffic, to the County for review. The Contractor shall consider, and his plan for excavation shall reflect, the equipment and methods to be employed in the excavation. The prices

established in the Proposal for the Work to be done will reflect all costs pertaining to the Work.

1.02 QUALITY ASSURANCE

A. Testing laboratory employed by the County will make such tests as are deemed advisable. The Contractor shall schedule his work to permit a reasonable time for testing before placing succeeding lifts and shall keep the laboratory informed of his progress. Costs for initial testing shall be paid by the County; however, tests which have to be repeated because of the failure of the tested material to meet specification shall be paid for by the Contractor and the cost of re-testing shall be deducted from payments due the Contractor.

B. Standards

1. AASHTO: American Association of State Highway and Transportation Officials
2. ANSI: American National Standards Institute
3. ASCE: American Society of Civil Engineers
4. ASTM: American Society for Testing and Materials
5. AWWA: American Water Works Association
6. OSHA 29 CFR Subpart P – Excavations and Trenches a) 1926.650, 1926.651, 1926.652
7. OSHA 29 CFR Subpart J - a) 1910.146 for Confined Space Entry

1.03 JOB CONDITIONS

A. Existing Utilities

1. The Contractor is responsible for subsurface verification of existing utilities prior to construction. Locate existing utilities in the area of work in accordance with Sunshine State One Call regulations, Chapter 556, "Underground Facility Damage Prevention and Safety Act", FS.
2. Should uncharted or incorrectly charted piping or other utility be encountered during excavation, notify the County. Keep all facilities in operation and repair damaged utilities to the satisfaction of the County.
3. Damage and repair costs to such piping or utilities are the Contractor's responsibility.
4. If utilities are to remain in place, the Contractor shall provide adequate means of protection.

B. Test borings and the sub-surface exploration data if previously done on the site will be made available upon request and are for the Contractor's information only.

1.04 PROTECTION

A. Sheeting and Bracing

1. Requirements of the Trench Safety Act shall be adhered to at all times.

2. Furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, to protect adjacent structures and power poles from undermining, and to protect workers from hazardous conditions or other damage. Such support shall consist of braced steel sheet piling, braced wood lagging and soldier beams or other acceptable methods. If the County is of the opinion that at any point sufficient or proper supports have not been provided, the County may order additional supports put in at the expense of the Contractor, and compliance with such order shall not relieve or release the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and compacted. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill at no additional expense to the County.

3. The Contractor shall construct the sheeting outside the neat lines of the foundation unless indicated otherwise for the method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be adequate to withstand all pressure to which the structure or trench will be subjected. Any movement or bulging which may occur shall be corrected by the Contractor at their own expense so as to provide the necessary clearances and dimensions.

4. Where sheeting and bracing is required to support the sides of excavations for structures, the Contractor shall engage a Professional Geotechnical Engineer, registered in the State of Florida, to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design, and the Professional Engineer shall provide certification of this.

5. The installation of sheeting, particularly by driving or vibrating, may cause distress to existing structures. The Contractor shall evaluate the potential for such distress and, if necessary, take all precautions to prevent distress of existing structures because of sheeting installation.

6. The Contractor shall leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the County may direct him in writing to leave in place at any time during the progress of the Work for the purpose of preventing damage to structures, utilities, or property, whether public or private. The County may direct that timber used for sheeting and bracing be cut off at any specified elevation.

7. All sheeting and bracing not left in place shall be carefully removed in such manner as not to endanger the construction or other structures, utilities, 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, or otherwise as may be directed by the County.

8. The right of the County to order sheeting and bracing left in place shall not be construed as creating any obligation on the County's part to issue such orders, and their failure to exercise this right shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the Work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

9. No wood sheeting is to be withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any wood sheeting be cut off at a level lower than 1-foot above the top of any pipe.

B. Pumping and Drainage:

1. The Contractor shall at all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures, or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing the water level to return to the natural level as stipulated in Section 02140 "Dewatering." The Contractor shall engage a Professional Geotechnical Engineer registered in the State of Florida to design the dewatering systems. The Contractor shall submit to the County for a plan for dewatering systems prior to commencing work. The dewatering system installed shall be in conformity with the overall construction plan, and the Professional Engineer shall provide certification of this. The Professional Engineer shall be required to monitor the performance of the dewatering systems during the progress of the Work and require such modifications as may be required to assure that the systems are performing satisfactorily.

2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at the proposed bottom of excavation and to preserve the integrity of adjacent structures. Dewatering by trench pumping will not be permitted if migration of fine grained natural material from bottom, sidewalls, or bedding material will occur.

3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and pumped from the excavation to maintain a bottom free from standing water.

4. The Contractor shall take all additional precautions to prevent uplift of any structure during construction.

5. Permission to use any storm sewers or drains for water disposal purposes shall be obtained from the authority having jurisdiction. Any requirements and costs for such use shall be the responsibility of the Contractor. However, the Contractor shall not cause flooding by overloading or blocking up the flow in the drainage facilities, and he shall leave the facilities unrestricted and as clean as originally found. Any damage to facilities shall be repaired or restored as directed by the County or the authority having jurisdiction, at no cost to the County.

6. The Contractor shall prevent flotation by maintaining a positive and continuous operation of the dewatering system. The Contractor shall be fully responsible and liable for all damages which may result from failure of this system.

7. Removal of dewatering equipment shall be accomplished after compaction/density testing has been completed and the system is no longer required. The Contractor shall remove the material and equipment constituting the system.

8. The Contractor shall take all necessary precautions to preclude the accidental discharge of fuel, oil, or other contaminates in order to prevent adverse effects on groundwater quality.

1.05 TESTING AND INSPECTION SERVICE

A. The County will provide a geotechnical testing and inspection service. The services include testing soil materials and quality control testing during filling and backfilling operations. Samples of soil materials shall be furnished to the testing service by the Contractor. The County shall pay costs of initial geotechnical testing. The Contractor shall pay for any subsequent testing required due to failure and laboratory stand-by charges incurred.

B. The Contractor shall provide monthly density testing reports to the County during backfilling activities. Density testing reports not submitted in a timely manner shall result in rejection of the pipe installed and rejection of the density testing reports until such time that density re-testing is coordinated and repeated at the Contractors expense.

C. Density testing scheduled subsequent to backfilling activities shall be coordinated with, and witnessed by the County. Failure by the Contractor to coordinate or have the County present shall result in rejection of the submitted density testing reports and re-testing at the Contractor's expense.

D. Dewatering systems shall not be removed until compaction/density testing has been completed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General:

1. All fill material shall be subject to the review and acceptance of the County.

2. All fill material shall be free of organic material, trash, or other objectionable material. The Contractor shall remove excess or unsuitable material from the job site.

B. Common Fill Material: Common fill shall consist of mineral soil, substantially free of clay, organic material, muck, loam, wood, trash, and other objectionable material which may be compressible or which cannot be compacted properly. Common fill shall not contain stones larger than 3-1/2-inches in any dimension in the top 12-inches or 6-inches in any dimension in the balance of fill area. Common fill shall not contain asphalt, broken concrete, masonry, rubble or other similar materials. It shall have physical properties that allow it to be easily spread and compacted during filling. Additional common fill shall be no more than 12 % by weight finer than the No. 200 mesh sieve, unless finer material is approved for use in a specific location by the County. Select Common Fill shall be as specified as above from common fill, except that the material shall contain no stones larger than 1/2-inches in largest dimension, and shall be no more than 5 % by weight finer than the No. 200 mesh sieve.

C. Structural Fill: Structural fill shall be reasonably well graded sand to gravelly sand having the following gradation:

US Sieve Size	Percent Passing By Weight
No. 1	100
No. 4	75 - 100
No. 40	15 - 80
No. 100	0 - 30
No. 200	0 - 12

D. Class 1 Soils*: Manufactured angular, granular material, 1/4 to 1-1/2-inches (6 to 4 mm) size, including materials having significance such as crushed stone or rock, broken coral, crushed slag, cinders, or crushed shells. Sieve analysis for crushed stone is given below separately.

Crushed Stone: Crushed stone shall consist of clean mineral aggregate free from clay, loam or organic matter, conforming to ASTM C33 stone size No. 89 and with particle size limits as follows:

U.S. Sieve Size	% Passing By Weight
½	100
3/8	100

No. 4	20 – 25
No. 8	5 – 30
No. 16	0 - 10
No. 50	0 - 2

E. Class II Soils**:

1. GW: Well graded gravels and gravel-sand mixtures, little or no fines. Fifty percent or more retained on No. 4 sieve. More than 95 % retained on No. 200 sieve. Clean.

2. GP: Poorly graded gravels and gravel-sand mixtures, little or no fines. Fifty percent or more retained on No. 4 sieve. More than 95 % retained on No. 200 sieve. Clean.

3. SW: Well graded sands and gravelly sands, little or no fines. More than passes No. 4 sieve. More than 95 % retained on No. 200 sieve. Clean.

4. SP: Poorly graded sands and gravelly sands, little or no fines. More than 50 % passes No. 4 sieve. More than 95 % retained on No. 200 sieve. Clean.

*Soils defined as Class I materials are not defined in ASTM D2487.

**In accordance with ASTM D2487, less than 5 % pass No. 200 sieve.

F. Coarse Sand: Sand shall consist of clean mineral aggregate with particle size limits as follows:

U.S. Sieve Size	Percent Passing By Weight
3/8	100
No. 10	85 – 100
No. 40	20 – 40
No. 200	0 - 12

G. Other Material: All other material, not specifically described, but required for proper completion of the Work shall be selected by the Contractor and acceptable by the County.

PART 3 - EXECUTION

3.01 PREPARATION

A. Clearing:

1. The construction areas shall be cleared of all obstructions and vegetation including large roots and undergrowth within 10-feet of the lines of the excavation.

2. Strip and stockpile topsoil on the site at the location to be determined by the County.

3.02 EXCAVATION

A. General: Excavations for roadways, structures, and utilities must be carefully executed in order to avoid interruption of utility service.

B. Excavating for Roadways/Structures/Utilities:

1. Excavation shall be made to such dimensions as will give suitable room for building the foundations and the structures, for bracing and supporting, for pumping and draining, and for all other work required.

a. Excavation for precast or prefabricated structures shall be carried to an elevation 2-feet lower than the proposed outside bottom of the structure to provide space for the select backfill material. Prior to placing the select backfill, the excavation shall be measured by the County to verify that the excavation has been carried to the proper depth and is reasonably uniform over the area to be occupied by the structure.

b. Excavation for structures constructed or cast in place in dewatered excavations shall be carried down to the bottom of the structure where dewatering methods are such that a dry excavation bottom is exposed and the naturally occurring material at this elevation leveled and left ready to receive construction. Material disturbed below the founding elevation in dewatered excavations shall be replaced with Class B concrete.

c. Footings: Cast-in-place concrete footing sides shall be formed immediately after excavation.

2. Immediately document the location, elevation, size, material type and function of all new subsurface installations, and utilities encountered during the course of construction.

3. Excavation equipment operators and other concerned parties shall be familiar with subsurface obstructions as shown on the Drawings and should anticipate the encounter of unknown obstructions during the course of the Work.

4. Encounters with subsurface obstructions shall be hand excavated.

5. Excavation and dewatering shall be accomplished by methods that preserve the undisturbed state of subgrade soils. Subgrade soils which become soft, loose, "quick" or otherwise unsatisfactory for support of structures as a result of inadequate dewatering or other construction methods shall be removed and replaced by crushed stone as required by the County at the Contractor's expense.

6. The bottom of excavations shall be rendered firm and dry before placing any piping or structure.

7. All pavements shall be cut with saws or approved power tools prior to removal.

8. Excavated material shall be stockpiled in such a manner as to prevent nuisance conditions. Surface drainage shall not be hindered. Excavated material not suitable for backfill shall be removed from the site and disposed of by the Contractor.

3.03 DRAINAGE

A. The Contractor shall at all times during construction provide and maintain proper equipment and facilities to remove promptly and dispose of properly all water entering excavations, and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition. The dewatering method used shall prevent disturbance of earth below grade.

B. All water pumped or drained from the Work shall be disposed of in a suitable manner without undue interference with other work, without damage to surrounding property, and in accordance with pertinent rules and regulations.

C. No construction, including pipe laying, shall be allowed in water. No water shall be allowed to contact masonry or concrete within 24-hours after being placed. The Contractor shall constantly guard against damage due to water and take full responsibility for all damage resulting from his failure to do so.

D. The Contractor will be required at his expense to excavate below grade and refill with crushed stone (gradation 57 or 89) or other acceptable fill material if the County determines that adequate dewatering has not been provided.

3.04 UNDERCUT

A. If the bottom of any excavation is below that shown on the Drawings or specified because of Contractor error, convenience, or unsuitable subgrade due the Contractor's excavation methods, he shall refill to normal grade with fill at his own cost. Fill material and compaction method shall be approved by the County.

3.05 FILL AND COMPACTION

A. Compact and backfill excavations and construct embankment according to the following schedule. (Modified Proctor standard shall be ASTM D-1557):

STRUCTURES AND ROADWORK

Area	Material	Compaction

Beneath Structures	Structural Fill	12-inch lifts, compacted to 98% maximum density as determined by AASHTO T-180. Fill Should not be placed over any in-place soils until those deposits have been compacted to 98% Modified Proctor.
Around Structures	Structural Fill	12-inch lifts, 95% of maximum density as determined by AASHTO T-180. Rubber Tire or vibratory plate compactors shall be used
Beneath Paved Surfaces	Common Fill	12-inch lifts, 98% by maximum density as determined by AASHTO T-180 or as required by the FDOT Standards.
Open Areas	Common Fill	12-inch lifts, 95% by maximum density as determined by AASHTO T-180.

B. Pipe shall be laid in open trenches unless otherwise indicated on the Drawings or elsewhere in the Contract Documents.

C. Excavations shall be backfilled to the original grade or as indicated on the Drawings. Deviation from this grade because of settling shall be corrected. The backfill operation shall be performed to comply with all rules and regulations and in such a manner that it does not create a nuisance or safety hazard.

D. Embankments shall be constructed true to lines, grades, and cross sections shown on the plans or ordered by the County. Embankments shall be placed in successive layers of not more than 8-inches in thickness, loose measure, for the full width of the embankment. As far as practicable, traffic over the Work during the construction phase shall be distributed so as to cover the maximum surface area of each layer.

E. If the Contractor requests approval to backfill material utilizing lifts and/or methods other than those specified herein, such request shall be in writing to the County. Acceptance will be considered only after the Contractor has performed tests, at the Contractor's expense, to identify the material used and density achieved throughout the backfill area utilizing the method of backfill requested. The County's acceptance shall be in writing.

F. One compaction test location shall be required for each 300 linear feet of pipe and for every 100 square feet of backfill around structures as a minimum. The County may determine that more compaction tests are required to certify the installation depending on field conditions. The locations of the compaction tests within the trench shall be in conformance with the following schedule:

1. At least one test at the spring line of the pipe.

2. At least one test for each 12-inch layer of backfill within the pipe bedding zone for pipes 24-inches and larger.

3. One test at an elevation of 1-foot above the top of pipe.

4. One test for each 2-feet of backfill placed from 1-foot above the top of the pipe to finished grade elevation.

5. Density testing is required for sanitary sewer manholes. Tests shall be staggered around the manhole within 3-feet of the structure's outside diameter.

   a. First test shall be 1-foot above the structure base.
   b. Second test shall be 2-feet above the first test and subsequent tests every 2-feet up the finished grade.

6. The Contractor shall provide additional compaction and testing prior to commencing further construction if the County's testing reports and inspection indicate that the fill has been placed below specified density.

7. The Contractor shall coordinate testing with the County approved testing laboratory and shall provide monthly test results to the County in a timely manner during construction activities. Density testing scheduled subsequent to backfilling activities shall be coordinated with the County and witnessed by the County representative. Failure by the Contractor to coordinate or have the County representative present shall result in rejection of the submitted density testing reports and re-testing at the Contractor's expense. Density testing reports not submitted in a timely manner shall result in rejection of the pipe installed and rejection of the density testing reports until such time that density re-testing is coordinated and repeated at the Contractor's expense as deemed necessary by the County's representative.

8. Dewatering systems shall not be removed until compaction/density testing has been completed.

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SECTION 02576
CONCRETE SIDEWALKS AND DRIVEWAYS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Constructing new concrete and driveways as shown on the Drawings.

1.02 QUALITY ASSURANCE

A. Codes and Standards: Comply with applicable sections of F.D.O.T. Specifications and local governing regulations.

B. The mixture, placement, and curing of all concrete work shall be in accordance with F.D.O.T. Specifications.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. Furnish manufacturer's product data, design mixes, test reports, and materials certifications.

1.04 JOB CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Utilize flagman, barricades, warning signs, and warning lights as required.

1.05 GUARANTEE

A. All restored areas within the public right-of-way shall be guaranteed for 1-year after final acceptance. In the event of cracked or broken concrete surfaces, the Contractor shall make the necessary repairs to restore the concrete within 10-calendar days after notification by the County. The cost of such repairs shall be paid by the Contractor.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 CONCRETE MATERIALS

A. Forms: Steel or wood for each type of use of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radius bends as required.

2. Coat forms with a non-staining form release agent that will not discolor or deface the surface of the concrete.

B. Fibermesh Reinforcement: Fibermesh reinforcement fibers shall be 2-inches to 3-inches collated polypropylene fibers. Fibers shall be in strict accordance with the manufacturer recommendations and within the time as specified in ASTM C94, Type III 4.13 and applicable building codes.

C. Concrete Materials: Comply with requirements of F.D.O.T. Section 347 for concrete materials, admixtures, bonding materials, curing materials, and others as required.

D. Epoxy Resin Grout: Type N as specified in F.D.O.T. Section 926.

E. Aggregate, brick, or other material required to match existing driveway or walk shall be as approved by the County.

2.03 CONCRETE MIX, DESIGN, AND TESTING

A. Comply with requirements of applicable F.D.O.T. Section 347 for concrete mix design, sampling and testing, and quality control, and as herein specified.

B. Design the mix to produce standard weight concrete consisting of Portland cement, aggregate, air entraining admixture, and water to produce the following properties.

1. Compressive Strength: Class B, 3,000 psi for walks and curbs.

2. Compressive Strength: Class A, 4,000 psi for driveways.

3. Air Content: 3% to 6% .

C. Concrete slump shall not exceed plus or minus 1-inch from approved design slump.

PART 3 - EXECUTION

3.01 CONCRETE SIDEWALK, DRIVEWAY, AND CURB AND GUTTER

A. Surface Preparation:

1. Remove loose material from the compacted sub base surface immediately before placing concrete.

2. Proof-roll prepared sub base surface to check for unstable areas and the need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

B. Form Construction:

1. Set forms to the required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of the Work and so that forms can remain in place at least 24-hours after concrete placement.

2. Check completed form work for grade alignment to the following tolerances:

   a. Top of forms not more than 1/8-inch in 10-feet.
   b. Vertical face on longitudinal axis, not more than 1/4-inch in 10-feet.

3. Clean forms for reuse immediately after use, and coat with form release agent as often as required to ensure separation from concrete without damage.

C. Concrete Placement:

1. Do not place concrete until sub base and forms have been checked for line and grade. Moisten if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are completed to required finish elevation and alignment. Use special colors or aggregate as required to match existing material.

2. Place concrete using methods which prevent segregation of the mix. Consolidate concrete along the face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices. Do not use vibrators to push or move concrete in forms or chute.

3. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2-hour, place a construction joint.

4. An automatic machine may be used for sidewalk or curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results which meet or exceed the minimum herein specified. Machine placement must produce sidewalks and/or curbs and gutters to the required cross-section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.

5. Joints: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures place transverse joints to align with previously placed joints, unless otherwise indicated.

   a. Weakened-Plane Joints: Provide weakened-plane (contraction) joints sectioning concrete into areas as shown on the Drawings. Construct weakened plane joints for a depth equal to at least 1/4 concrete thickness, by sawing within 24-hours of placement or formed during finishing operations. Place joints at intervals not to exceed 10-feet if not otherwise indicated.

b. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than 1/2-hour, except where such pours terminate at expansion joints. Construction joints shall be as shown or, if not shown, use standard metal keyway-section form of appropriate height.

c. Expansion Joints:

i. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basin, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

ii. Locate expansion joints at 12-feet on center for concrete walks unless otherwise indicated.

iii. Extend joint fillers full-width and depth of joint, and not less than 1/2-inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.

iv. Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Pieces shorter than 4-inches shall not be used unless specifically shown as such.

v. Protect the top edge of the joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

vi. Fillers and Sealants: Comply with the requirements of these specifications for preparation of joints, materials installation, and performance, and as herein specified.

D. Concrete Finishing:

1. After striking-off and consolidating concrete, smooth the surface by screening and floating. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture.

2. After floating, test surface for trueness with a 20-foot straightedge. Variations exceeding 1/3-inch for any two points within 10-feet shall not be acceptable. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

3. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round 10-1/2-inch radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.

4. After completion of floating and when excess moisture or surface sheen has disappeared, broom finish sidewalks by drawing a fine-hair broom across concrete surface, perpendicular to a line of pedestrian traffic. If the existing material has another finish, match existing finish.

5. Do not remove forms for 24-hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas.

E. Curing:

Protect and cure finished concrete paving and walks, complying with applicable requirements of F.D.O.T. Section 350. Use moist-curing methods for initial curing of approved concrete curing compounds whenever possible.

F. Repairs and Protections:

1. Repair or replace broken or defective concrete, as directed by the County.

2. Drill test cores where directed by the County, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy resin grout.

3. Protect concrete from damage until acceptance of work. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

4. Sweep concrete pavement and wash free of stains and discolorations, dirt, and other foreign material just prior to final inspection.

3.02 FIELD QUALITY CONTROL

A. General: Repair or remove and replace unacceptable concrete sidewalk, driveways, or curb and gutter as directed by the County.

B. Surface Elevation: Actual surface elevations shall be within ± 0.05 feet of specified or indicated elevations an any given point. Surface elevations between any 2 given points shall be interpolated from a direct line between the 2 points. Surfaces exceeding actual elevation tolerances of more than ± 0.05 feet at any 2 points within a distance of 15-feet will not be acceptable.

END OF SECTION

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SECTION 02578
SOLID SODDING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Establishing a stand of grass by furnishing and placing grass sod. Included are fertilizing, watering, and maintenance as required to assure a healthy stand of grass. Solid sodding shall be placed on all slopes greater than 4:1, within 10-feet of all proposed structures, and in all areas where existing grass or sod (regardless of it's condition) is removed or disturbed by Contractor's operation unless otherwise specified or shown on the Drawings.

1.02 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

1. A certification of sod quality by the producer shall be delivered to the County ten days prior to use.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 GRASS SOD

A. Grass sod for the road rights-of-way shall be of variety to match the existing adjacent area and shall be well matted with grass roots. The sod shall be taken up in rectangles, preferably 12-inch by 24-inch, shall be a minimum of 2-inches in thickness, and shall be live, fresh, and uninjured at the time of planting.

B. Grass sod for restoration of new construction sites and/or areas disturbed by construction on existing sites shall be Bahia well matted with grass roots. The sod shall be taken up in rectangles, preferably 12-inch by 24-inch, shall be a minimum of 2-inches in thickness, and shall be live, fresh, and uninjured at the time of planting.

C. It shall be reasonably free of weeds and other grasses and shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. The sod shall be planted as soon as possible after being dug and shall be shaded and kept moist until it is planted.

2.03 FERTILIZER

A. Commercial fertilizers shall comply with the state fertilizer laws.

B. The numerical designations for fertilizer indicate the minimum percentages (respectively) of (1) total nitrogen, (2) available phosphoric acid, and (3) water-soluble potash contained in the fertilizer.

C. The chemical designation of the fertilizer shall be 6-6-6. At least 50% of the nitrogen shall be derived from organic sources. At least 50 % of the phosphoric acid shall be from normal super phosphate or an equivalent source, which will provide a minimum of two units of sulfur. The amount of sulfur shall be indicated on the quantitative analysis card attached to each bag or other container.

2.04 WATER FOR GRASSING

A. The water used in the sodding operations shall be by the Contractor as approved by the County.

PART 3 - EXECUTION

3.01 PREPARATION OF GROUND

A. The area over which the sod is to be placed shall be scarified or loosened to a depth and then raked smooth and free from debris. Where the soil is sufficiently loose and clean, the County, at its discretion, may authorize the elimination of ground preparation.

3.02 APPLICATION OF FERTILIZER

A. Before applying fertilizer, the soil pH shall be brought to a range of 6.0 - 7.0.

B. The fertilizer shall be spread uniformly over the area to be sodded at the rate of 700-pounds per acre, or 16-pounds per 1,000 square feet, 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.

C. 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.

3.03 PLACING SOD

A. 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.

B. Where sodding is used in drainage ditches, or on slopes of 4:1 or greater, the setting of the pieces shall be staggered 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.

C. On slopes greater than 2:1, the Contractor shall, if necessary, prevent the sod from sliding by means of wooden pegs driven through the sod blocks into firm earth at suitable intervals.

D. Sod which has been cut for more than 72-hours shall not be used unless specifically authorized by the County after the inspection thereof. Sod which is not planted within 24-hours after cutting shall be stacked in an approved manner, maintained, and properly moistened. Any pieces of sod that, after placing, show an appearance of extreme dryness shall be removed and replaced by fresh, uninjured pieces.

E. Sodding shall not be performed when weather and soil conditions are, in the County's opinion, unsuitable for proper results.

3.04 WATERING

A. The areas on which the sod is to be placed shall contain sufficient moisture, as determined by the County, 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).

3.05 MAINTENANCE

A. The Contractor shall maintain, at his expense, the sodded areas in a satisfactory condition until final acceptance of the Project. Such maintenance shall include repairing of any damaged areas and replacing areas in which the establishment of the grass stand does not appear to be developing satisfactorily.

B. Replanting or repair necessary due to the Contractor's negligence, carelessness, or failure to provide routine maintenance shall be at the Contractor's expense.

END OF SECTION

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SECTION 03100
CONCRETE FORMWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: This Section specifies all labor, materials and equipment necessary for providing and installing formwork for concrete.

B. Related Work Described Elsewhere:

1. Section 03200 "Concrete Reinforcement"
2. Section 03300 "Cast-in-Place Concrete"

C. General Design: The Contractor shall be responsible for the design of all formwork and for safety in its construction, use and removal.

1.02 QUALITY ASSURANCE

A. Qualifications: Formwork shall be constructed in accordance with the specified standards, as well as all pertinent codes and regulations. In cases where requirements of pertinent codes conflict with the requirements of these specifications, the more stringent shall govern.

B. Standards: Unless otherwise indicated, all materials, workmanship and practices shall conform to the following standards:

1. Standard Building Code
2. ACI 347 "Recommended Practice for Concrete Formwork"
3. Local codes and regulations

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County/Professional for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. Materials: Submit manufacturer's literature on form ties, spreaders, corner formers, form coatings and bond breakers.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 MATERIALS

A. Form Lumber: Use form lumber when in contact with exposed concrete, conforming to the following or acceptable equivalent.

B. Lumber: Douglas Fir/Larch No. 2 grade, seasoned, surfaced on four sides.

C. Plywood: "Plyform", Class I or II, bearing the label of the Douglas Plywood Association. (Minimum 3/4-inch thickness).

D. Form Ties: Use form ties which do not leave an open hole through the concrete and which permit neat and solid patching at every hole. Use embedded rods with integral waterstops and cones to provide a 1-inch breakback. Wire ties and wood spreaders will not be permitted.

E. Form Coatings: Form release coating shall be a paraffin base oil or mineral oil coating which effectively prevents absorption of moisture; prevents bonding with concrete; is non-staining to concrete; and leaves the concrete with a paintable surface.

F. Chamfer Strips: Chamfer strips shall be polyvinyl strips or acceptable equal, designed to be nailed in the forms to provide a 3/4-inch chamfer (unless indicated otherwise) at exposed edges of concrete members.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Construction of Formwork: Forms shall be sufficiently strong to withstand the pressure resulting from the placement and vibration of concrete and shall be sufficiently rigid to maintain specified tolerances. Forms shall be sufficiently tight to prevent loss of mortar, and shall be adequately braced against lateral, upward or downward movement.

B. Coating of Forms: Apply form coating to board forms prior to placing reinforcing. Keep form coatings off steel reinforcing, items to be embedded, and previously placed concrete.

C. Form Erection:

1. Provide a means of holding adjacent edges, ends of panels, and ends of sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects of the finished concrete. Insure that forms may be removed without damage to the surface of the finished concrete.

2. Provide a positive means of adjustment of shores and struts. Insure that all settlement is taken up during concrete placing.

3. Temporary openings shall be provided in wall forms to limit the free fall of concrete to a maximum of 6-feet unless an elephant trunk is used. Such openings

shall be located to facilitate placing and consolidation and shall be spaced no more than 8-feet apart. Temporary openings shall also be provided in the bottom of the wall, column forms, and elsewhere as necessary to facilitate cleaning and observation immediately prior to placing.

4. Do not embed any form-tying device or part thereof other than metal in concrete.

5. Form surfaces of concrete members except where placement of the concrete is against the ground. The dimensions of concrete members shown on the Drawings apply to formed surfaces, except where otherwise indicated.

D. Form Reuse: Reuse only forms which maintain a uniform surface texture on exposed concrete surfaces. Apply light sanding between uses to obtain such a uniform texture. Plug unused tie rod holes with corks, shave flush, and sand the concrete surface side of the plug.

E. Removal of Forms

1. Forms and shoring for elevated structural slabs, girders, and/or beams shall remain in place until the concrete has reached a compressive strength equal to the specified 28-day compressive strength as determined by test cylinders. Do not remove supports and re-shore. The following table indicates the minimum allowable time after the last concrete is placed before forms, shoring, and/or bracing may be removed.

Structural Item	Minimum Allowable Time
Bottom side of slabs, girders, beams	When concrete reaches specified 28-day compressive strength
Vertical sides of girders, beams	48-hours
Walls not supporting vertical or horizontal loads	48-hours
Walls supporting vertical or horizontal loads	When concrete reaches specified 28-day compressive strength
Footings, pipe encasements, pipe supports	24-hours

2. Do not remove forms from concrete which has been placed with outside air temperature below 50° F without first determining if the concrete has properly set regardless of the minimum times specified in the table above. Do not apply heavy loading on recently poured concrete. Immediately after forms are removed, the surface of the concrete shall be carefully examined and any irregularities in the surface shall be repaired and finished as specified.

F. Formed Openings: Openings shall be of sufficient size to permit final equipment alignment without deflection or offsets of any kind. Where the items pass through the wall, allow space for packing to ensure watertightness. Provide openings with

continuous keyways with waterstops where required. Provide a slight flare to facilitate grouting and the escape of entrained air during grouting. Provide reinforcement as indicated and specified. Reinforcing steel shall be at least 2-inches clear from the opening.

G. Embedded Items: Set anchor bolts and other embedded items accurately and hold securely in position in the forms until the concrete is placed and set. Check all special castings, channels, or other metal parts that are to be embedded in the concrete prior to and again after concrete pour. Check all nailing, blocks, plugs, and strips necessary for the attachment of trim, finish, and similar work prior to concrete pour.

H. Pipes and Wall Spools Cast in Concrete

1. Install wall spools, wall flanges, and wall anchors before placing concrete. Do not weld, tie or otherwise connect the wall spools to the reinforcing steel.

2. Support pipe and fabricated fittings to be encased in concrete on concrete piers or pedestals. Carry concrete supports to firm foundations so that no settlement will be possible during Construction.

I. Form Tolerances

1. Failure of the forms to produce the specified concrete surface tolerance shall be grounds for rejection of the concrete work. Rejected Work shall be repaired or replaced at no cost to the County.

2. The following table indicates tolerances or allowable variations from dimensions or positions of structural concrete work:

	Maximum Tolerance
Sleeves and inserts	+1/4-inch to -1/4-inch
Projected ends of anchors	+1/4-inch to -0.0-inch
Anchor bolt setting	+1/4-inch to -1/4-inch
Finished concrete	+ 1/4-inch to -1/4-inch in 10 feet of length

3. The planes or axes from which the above tolerances are to be measured shall be as follows:

Sleeves and inserts	Centerline of sleeve or insert
Projected ends of anchors	Plane perpendicular to the end of the anchor as located on the Drawings
Anchor bolt setting	Centerline of anchor bolts
Finished concrete	The concrete surface as located on the Drawings

4. Where equipment is to be installed, comply with manufacturer's tolerances if more stringent than above.

END OF SECTION

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SECTION 03200
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: This Section specifies reinforcing steel and welded wire mesh for cast-in-place or precast concrete structures.

B. Related Work:

1. Section 03100 "Concrete Formwork"
2. Section 03300 "Cast-in-Place Concrete"
3. Section 03410 "Precast Concrete Structures"

1.02 QUALITY ASSURANCE

A. Standards: Unless otherwise indicated, all materials, workmanship, and practices shall meet all requirements of the current editions of the following standards:

1. Standard Building Code
2. ACI 318 Building Code Requirements for Reinforced Concrete
3. ACI 315 Details and Detailing of Concrete Reinforcement
4. CRSI Manual of Standard Practice, MSP-2

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County/Professional for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. Complete shop drawings shall be submitted for comment, including bar lists and placing drawings. Drawings shall show the type, spacing, and location of metal bar supports, the grade of the reinforcing and the name of the manufacturer. The type of coupler splice devices shall be designated.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 MATERIALS

A. Reinforcing Bars: ASTM A615, Grade 60, deformed billet steel bars of a USA manufacturer.

B. Welded Wire Fabric: ASTM A185, galvanized.

C. Metal Bar Supports: CRSI MSP-2, Chapter 3, Class 2, Type B, Stainless Steel Protected Bar Supports.

D. Coupler Splice Devices: Cadweld tension couplers capable of developing the ultimate strength of the bar, as manufactured by Erico Products, Incorporated, Solon, Ohio, or equal where acceptable to the County.

2.03 FABRICATION

A. Fabrication shall meet all requirements of the specified standards. Unless otherwise indicated, the following shall apply:

1. Hooks shall be standard hooks.

2. Bottom bars shall extend a minimum of 6-inches into supporting members.

3. Minimum cover shall be measured to the outermost stirrup, tie or bar.

4. Splices are permitted only where indicated on the Drawings.

PART 3 - EXECUTION

1.01 INSTALLATION

A. Supporting Reinforcing: Bar supports shall be provided as required by CRSI MSP-2 and AC1315. Top and bottom bars in slabs formed on earth shall be supported on precast concrete block supports except where such bars are properly supported from formwork. Precast concrete block supports are not required in slabs formed on tremie concrete but may be used at the Contractor's option.

B. Placing Reinforcing: Placing of reinforcing steel and welded wire fabric shall conform to CRSI MSP-2, ACI 315, and the Drawings. Reinforcing shall be securely tied and supported to prevent displacement during concrete placement.

C. Welded Wire Fabric: Splices in welded wire fabric shall be such that the overlap between outermost cross wires of each fabric sheet is not less than the spacing of the cross wires, plus 2-inches. Fabric shall not be extended through expansion joints or construction joints in slabs on grade except as otherwise indicated on the Drawings.

D. Coupler Splice: Unless indicated on the Drawings or where conventional lap splices cannot be achieved, full positive tension connections shall be provided. Such devices shall be installed in accordance with the recommendations of the manufacturer.

E. Dowels: Dowels shall be wired in position prior to placing concrete.

F. Field Bending: Heat shall not be used to bend bars. Bars shall not be bent after being embedded in concrete.

G. Welding: Welding of reinforcing will not be permitted.

H. Place reinforcement a minimum of 2-inches clear of any metal pipe or fittings.

END OF SECTION

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SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: This Section specifies cast-in-place concrete including all materials, mixing and transport, and performing all labor for the proportioning, mixing, transporting, placing, consolidating, finishing, and curing of concrete.

B. Related Work Described Elsewhere:

1. Section 03100 "Concrete Formwork"
2. Section 03200 "Concrete Reinforcement"

1.02 QUALITY ASSURANCE

A. Standards: Unless otherwise indicated, all materials, workmanship and practices shall conform to the requirements of the following standards:

1. Standard Building Code
2. Local Codes and Regulations
3. ACI 318-83, Building Code Requirements for Reinforced Concrete

B. Plant Qualification: Plant equipment and facilities shall meet all requirements of the checklist for Certification of Ready Mixed Concrete Production Facilities of the National Ready Mixed Concrete Association and ASTM C 94.

C. Evaluation and Acceptance of Concrete: Evaluation and acceptance of concrete will be in accordance with ACI-318, Chapter 4.

1.02 SHOP DRAWINGS AND SUBMITTALS

D. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

E. Materials and Shop Drawings: The following information shall be submitted for review. No concrete shall be furnished until the County has reviewed submittal and no exceptions taken or other favorable response has been returned.

1. Plant Qualification: Satisfactory evidence shall be submitted indicating that the plant and operators have sufficient experience in providing the applicable design mix.

2. Materials: Satisfactory evidence shall be submitted indicating those materials to be used (including cement, aggregates and admixtures) meet the specified requirements.

3. Design Mix: The design mix to be used shall be prepared by qualified persons and submitted for review. Submit affidavit as to design mix performance over the preceding 6-months. The design of the mix is the responsibility of the Contractor subject to the limitations of the Specifications. Acceptance of this submission will be required only as minimum requirements of the Specifications have been met. Such acceptance will in no way alter the responsibility of the Contractor to furnish concrete meeting the requirements of the Specifications relative to strength and slump.

4. Ready Mix Concrete: Provide delivery tickets or weigh master's certificate per ASTM C 94, including weights of cement and each size aggregate, amount of water in the aggregate, and amount of water added at the plant. The amount of water added on the job shall be written on the ticket.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 MATERIALS

A. Cement

1. Cement for all concrete shall be domestic Portland cement that conforms to the requirements of ASTM Designation C 150 Type I, Type II or Type III. All sanitary sewer manholes, wetwells, pumping stations, tanks and structures exposed to wastewater shall be constructed with Type II cement. Type III cement for high early strength concrete shall be used only for special locations and only with the review and acceptance of the County. Type I cement may be used for buildings and tremie concrete.

2. Only 1 brand of cement shall be used in any individual structure unless acceptable by the County. Cement that has become damaged, partially set, lumpy or caked shall not be used and the entire contents of the sack or container that contains such cement will be rejected. No salvaged or reclaimed cement shall be used.

3. Fly ash shall not be used in either Class A or Class B concrete.

B. Aggregates:

1. ASTM C 33. Coarse aggregates shall be size No. 57. Block cell fill shall be size No. 89.

2. In addition to requirements of ASTM C 33 for structures exposed to wastewater, the following shall apply:

   a. Soft particles: 2% (2.0 percent)
   b. Chert as a soft impurity (defined in Table 3 of ASTM C 33): 1% (1.0 percent)
   c. Total of soft particles and chert as a soft impurity: 2% (2.0 percent)
   d. Flat and elongated particles (long dimension > 5 times short dimension): 15%.

C. Water: Clean and free from injurious amounts of deleterious materials.

D. Air Entraining Admixture: ASTM C 260.

E. Water Reducing and Retarding Admixture: ASTM C 494, Type D. Admixture shall not contain calcium chloride.

F. Epoxy Bonding Agent: Sikastix 370, Sikadur Hi Mod, Concresive 1001-LPL or acceptable equal.

2.03 MIXES (FOR ALL OTHER FOUNDATIONS EXCLUDING THE WALL DESIGN)

A. General Requirements

1. Mix Design: Proportioning shall be on the basis of field experience and/or trial mixtures as specified in ACI 318, Section 4.3. Data on consecutive compression tests and standard deviation shall be submitted. Proportioning for small structures may be by the water/cement ratio under special review and acceptance by the County. Concrete mix design shall comply with the Standard Building Code requirements.

2. Air Content: 5% plus or minus (±) 1% (Class A and B).

3. Slump: 4-inches plus or minus (±) 1-inch. 8-inches plus or minus (±) 1-inch for tremie concrete.

4. Water/cement ratio = 0.45 maximum (all concrete exposed to hydrostatic loading), 0.50 maximum (all other concrete).

5. Minimum Compressive Strength at 28-days

   a. Class A, 4,000-psi: Water and wastewater structures inclusive of tanks, ditches, pumping stations, tremie concrete and other structures in contact with process water.
   b. Class B, 3,000-psi: Building structures, curb and gutters, slabs, walks, encasements, thrust blocks, and pipe supports, etc. not in contact with process water.

c. Class C, 2,500-psi: Mix wherever specified in the standard drawings such as A103, A112, A303, A406 and A407-2.

B. Production of Concrete

1. General: Concrete shall be ready mixed and shall be batched, mixed and transported in accordance with ASTM C 94, except as otherwise indicated.

2. Air Entraining Admixture: Air entraining admixture shall be charged into the mixture as a solution and shall be measured by means of an acceptable mechanical dispensing device. The liquid shall be considered a part of the mixing water.

3. Water Reducing and Retarding Admixture: Water reducing and retarding admixture shall be added and measured as recommended by the manufacturer. The addition of the admixture shall be completed within 1-minute after addition of water to the cement has been completed, or prior to the beginning of the last 3/4 of the required mixing, whichever occurs first. Admixtures shall be stored, handled and batched in accordance with the recommendations of ACI 68.

C. Delivery Tickets: In addition to the information required by ASTM C 94, delivery tickets shall indicate the cement content and the water/cement ratio.

D. Temperatures: The temperature of the concrete upon delivery from the truck shall not exceed 90° F.

E. Modifications to the Mix: No modifications to the mix shall be made in the plant or on the job which will decrease the cement content or increase the water/cement ratio beyond that specified.

PART 3 - EXECUTION

3.01 PREPARATION

A. Preparations before Placing: No concrete shall be placed until the review and acceptance of the County has been received. Acceptance will not be granted until forms are clean and reinforcing and all other items required to be set in concrete have been placed and thoroughly secured. The County shall be notified a minimum of 24-hours before concrete is placed.

B. Conveying:

1. General: Concrete shall be handled from the truck to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients to maintain the quality of the concrete. No concrete shall be placed more than 90-minutes after mixing has begun for that particular batch.

2. Buckets and Hoppers: Buckets and hoppers shall have discharge gates with a clear opening equal to no less than 1/3 of the maximum interior horizontal

area, or 5 times the maximum aggregate size being used. Side slopes shall be no less than 60° (degrees). Controls on gates shall permit opening and closing during the discharge cycle.

3. Runways: Extreme care shall be exercised to avoid displacement of reinforcing during the placing of concrete.

4. Elephant Trunks: Hoppers and elephant trunks shall be used to prevent the free fall of concrete of more than 6-feet.

5. Chutes: Chutes shall be metal or metal lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20-feet long and chutes not meeting the slope requirements may be used only if they discharge into a hopper before distribution.

6. Pumping Equipment: Pumping equipment and procedures shall conform to the recommendations contained in the report of ACI Committee 304 on "Placing Concrete by Pumping Methods," ACI 304.2R-71. The specified slump shall be measured at the point of discharge. The loss of slump in pumping shall not exceed 1-1/2-inches.

7. Conveying equipment Construction: Aluminum or aluminum alloy pipe for tremies or pump lines and chutes, except for short lengths at the truck mixer shall not be permitted.

8. Cleaning: Conveying equipment shall be cleaned at the end of each concrete operation.

3.02 APPLICATION

A. Placing:

1. General: Concrete shall be deposited continuously, or in layers of such thickness (not exceeding 2-feet in depth) that no concrete will be deposited on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness.

2. Supported Elements: At least 2-hours shall elapse after depositing concrete in columns or walls before depositing in beams, girders, or slabs supported thereon.

3. Segregation: Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to procedures that will cause segregation.

4. Concrete Underwater: All concrete, except that indicated on the Drawings as tremie concrete, shall be placed in the dry.

B. Seals and Tremie Concrete

1. General

a. Wherever practicable, all foundation excavations shall be dewatered and the concrete deposited in the dry. Where conditions are encountered which render it impracticable to dewater the foundation before placing concrete, a concrete foundation seal shall be placed. The foundation shall then be dewatered, and the balance of the concrete placed in the dry.

b. When seal concrete is required to be placed, the satisfactory performance of the seal in providing a watertight excavation for placing structural concrete shall be the responsibility of the Contractor. Seal concrete placed by the Contractor, which subsequently fails to perform properly, shall be repaired as necessary to perform its required function, at the expense of the Contractor.

2. Method of Placing: Concrete deposited underwater shall be carefully placed in the space in which it is to remain by means of a tremie, a closed-bottom dump bucket of not less than 1-cubic yard capacity, or other approved method, and shall not be disturbed after it is deposited. All seal concrete shall be deposited in 1 continuous pour. No concrete shall be placed in running water. All formwork designed to retain concrete underwater shall be watertight, and the design of the formwork and excavation sheeting shall be by a Professional Engineer, registered in the State of Florida.

3. Use of Tremie: The tremie shall consist of a tube having a minimum inside diameter of 10-inches, and shall be constructed in sections having tight joints. No aluminum parts that have contact with the concrete will be permitted. The discharge end shall be entirely seated at all times, and the tremie tube kept full to the bottom of the hopper. When a batch is dumped into the hopper, the tremie shall be slightly raised (but not out of the concrete at the bottom) until the batch discharges to the bottom of the hopper, after which the flow shall be stopped by lowering the tremie. The means of supporting the tremie shall be such as to permit the free movement of the discharge end over the entire top surface of the Work, and shall permit it being lowered rapidly when necessary to choke off or retard the flow. The flow shall preferably be continuous, and in no case shall be interrupted until the Work is completed. Special care shall be exercised to maintain still water at the point of deposit.

4. Use of Bottom-dump Bucket: When the concrete is placed by means of a bottom-dump bucket, the bucket shall be lowered gradually and carefully until it rests upon the concrete already placed. The bucket shall then be raised very slowly during the discharge travel; the intent being to maintain, as nearly as possible, still water at the point of discharge and to avoid agitating the mixture. Aluminum buckets will not be permitted.

5. Time of Beginning Pumping: Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure, and in no case earlier than 72-hours after placement of the concrete.

C. Consolidating Concrete:

1. General: Concrete shall be consolidated by means of internal vibrators operated by competent workmen.

2. Vibrators: Vibrators shall have a minimum head diameter of at least 2-inches, a minimum centrifugal force of 700-pounds and a minimum frequency of 8,000 vibrations per second.

3. Vibrators for Confined Areas: In confined areas, the specified vibrators shall be supplemented by others having a minimum head diameter of 1-1/2-inches, a minimum centrifugal force of 300-pounds and a minimum frequency of 9,000 vibrations per second.

4. Spare Vibrator: One (1) spare vibrator for each 3 in use shall be kept on the site during all concrete placing operations.

5. Use of Vibrators: Vibrators shall be inserted and withdrawn at points approximately 18-inches apart. The duration of each insertion shall be from 5 to 15-seconds. Concrete shall not be transported in the forms by means of vibrators.

D. Protection: Rainwater shall not be allowed to increase the amount of mixing water, or to damage the surface finish. Concrete shall be protected from construction over-loads. Design loads shall not be applied until the specified strength has been attained.

3.03 CONCRETE FINISHING AND CURING

A. All slabs exposed to view shall receive a steel trowel finish without local depressions or high points and apply a light hair-broom finish. Do not use stiff bristle brooms or brushes. Leave hair-broom lines parallel to the direction of slab drainage.

B. All other slabs and footings shall receive a smooth steel trowel finish.

C. All walls of structures or parts of buildings exposed to view shall receive the following:

1. Repair defective concrete, remove fins, fill depressions 1/4-inch or deeper, and fill tie holes.

2. Any surface not receiving a special applied finish, shall receive a slurry finish consisting of 1 part cement and 1-1/2 parts sand by damp loose volume. Dampen surfaces and then apply the slurry with clean burlap pads or sponge rubber floats. Remove any surplus by scraping and then rubbing with clean burlap.

3. Surfaces that will receive a special applied finish shall be of even color, have no pits, pockets, holes, or sharp changes of surface elevation. Scrubbing with a stiff bristle fiber brush shall produce no dusting or dislodging of cement or sand.

D. All concrete shall be wet cured a minimum of 7-days; or if not to receive special finishes, coatings or concrete toppings, an acceptable curing compound may be utilized.

E. All surface defects shall be repaired by removing defective concrete down to sound concrete and repairing with patching mortar. Finished repair shall match adjacent concrete and be cured as specified.

3.04 TESTING

A. A testing laboratory, acceptable by the County, shall perform required testing. The Contractor shall pay for all tests indicating a failure to comply with the Specifications. The Contractor shall keep the laboratory informed of his schedule.

B. Standard laboratory compressive test cylinders shall be obtained by the laboratory when concrete is discharged at the point of placing (i.e., discharge end of pumping equipment), and cylinders shall be made and cured in accordance with the requirements of ASTM Designation C 31. A set of 4 cylinders shall be obtained for each 50-cubic yards, or fraction thereof, placed each day for each type of concrete. The cylinders shall be cured under laboratory conditions and shall be tested at 7 and 28-days of age in accordance with the requirements of ASTM Designation C 39.

C. The testing laboratory shall make slump tests of Class A and Class B concrete as it is discharged from the mixer at the point of placing. Slump tests shall be made for each 25-cubic yards or "pour" of concrete placed. Slump tests may be made on any batch, and failure to meet specified slump requirements shall be sufficient cause for rejection of that batch.

END OF SECTION

SECTION 03410
PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: This Section specifies the materials, labor and equipment required to construct the precast screen walls, as shown on the Drawings and as specified herein.

1.02 QUALITY ASSURANCE

A. Standards: Unless otherwise indicated, all materials, workmanship and practices shall conform to the following standards.

1. 2010 Florida Building Code
2. Local Codes and Regulations
3. ACI Building Code Requirements for Reinforced Concrete
4. American Society for Testing and Materials (ASTM)
5. American Concrete Institute (ACI)
6. National Precast Concrete Association (NPCA)

B. The forms, dimensions, concrete, and construction methods shall be acceptable to the County in advance of construction.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. The Contractor shall submit Shop Drawings to the County, showing all details of construction, reinforcing and joints. Submittal shall include a plan drawing showing confirmed post spacing along with indications of those panels which will have decorative texture of impressions. Include foundation design of drilled augers and indicate required pile depths at post embedments. Shop drawings shall be signed and sealed by a State of Florida registered Professional Engineer.

1.04 INSPECTION

A. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and acceptance by the County. Such inspection may be made at the place of manufacture or at the site after delivery, or at both places, and

the sections shall be subject to rejection at any time due to failure to meet any of the specification requirements; even though sample sections may have been acceptable as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All damaged sections will be rejected. If damaged sections have already been installed; they shall be acceptably repaired if authorized by the County, or removed and replaced at the Contractor's expense.

B. At the time of inspection, the sections will be carefully examined for compliance with the ASTM designation specified and the acceptable manufacturer's drawings. All sections shall be inspected for general appearance, dimension, "scratch strength", blisters, cracks, roughness, and soundness. The surface shall be dense and close textured.

C. Imperfections may be repaired subject to the review and acceptance of the County after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final review and acceptance. Cement mortar used for repairs shall have a minimum compressive strength of 4,000-psi at the end of 7-days and 5,000-psi at the end of 28-days, when tested in 3-inch by 6-inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the review and acceptance of the County.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS

A. The method of construction shall conform to the detailed Drawings appended to these specifications and the following additional requirements:

1. Concrete mix designs shall conform to specification 03300 and shall have a minimum compressive strength of 5,000psi. Mix designs with higher compressive strengths may be submitted for approval by the Engineer.

2. Sections shall be cured by an acceptable method for at least 28-days.

3. The various precast elements (posts and walls sections) shall be suitably shaped to mate with the adjoining precast section.

4. Concrete surfaces shall have form oil, curing compounds, dust, dirt, and other interfering materials removed by brush sand blasting and shall be fully cured prior to delivery.

5. Concrete wall panels shall be two toned in color as shown on Figure 1. The impressions shown in the particular Figure shall be located only on the panels shown in the Drawings. Textures referred to in Figure 1 shall be per FDOT index 5201.

6. Precast screen wall shall be provided by Duratek Precast Technologies, Brooksville, FL, Mack Concrete Industries Inc., Astatula, FL, Precast Wall Systems, Inc., Pompano Beach, FL or Engineer approved equal.

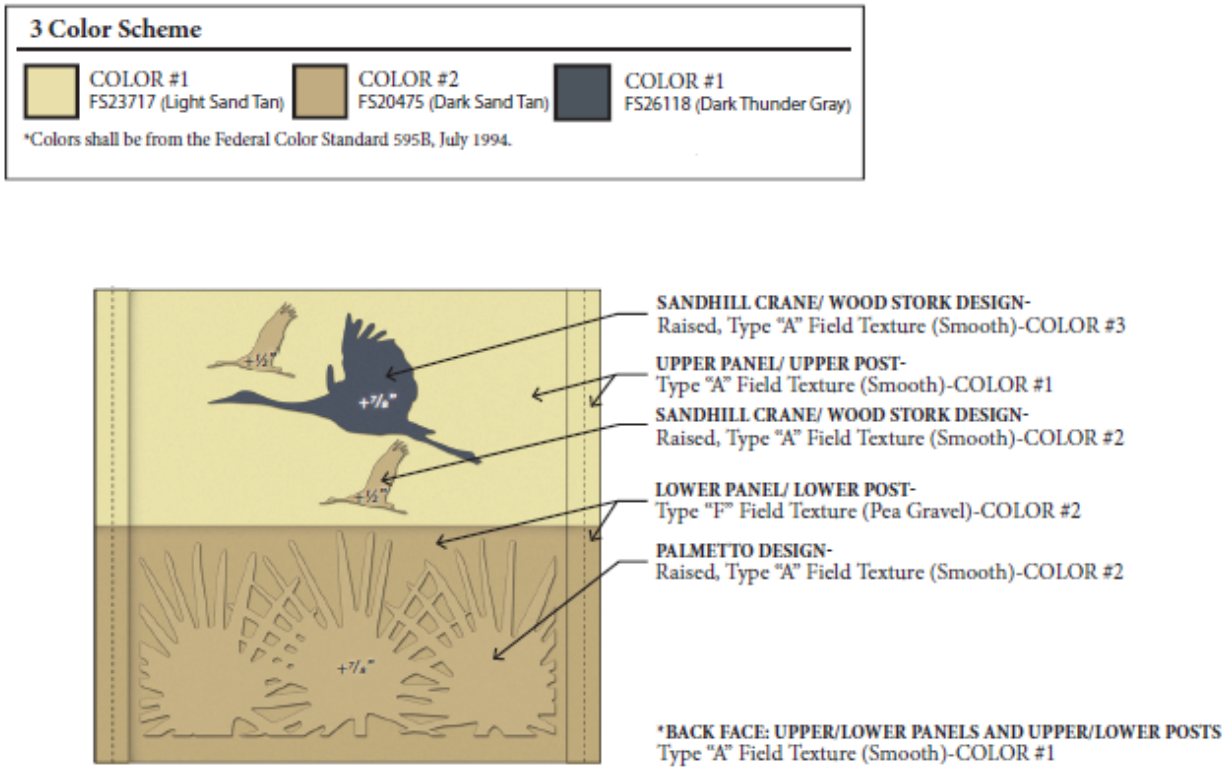

FIGURE 1: Typical precast wall panels (raised impressions shown are only to be supplied at locations shown on drawings)

PART 3 - EXECUTION

3.01 INSTALLATION

A. All components of the precast screen wall shall meet the following casting tolerances:

1. Overall Height and Width: ±1/4”
2. Thickness: ±1/4”
3. Plane of side mold: ±1/16”
4. Openings: ±1/2”
5. Out of Square: 1/8” per 6 foot but not more than 3/8” total along any side
6. Warping: 1/16” per foot distance to nearest corner

7. Bowing: 1/240 panel dimension

8. Surface smoothness for Type “A” (Smooth) Surface Texture Option: ±1/16” along a 10ft. straightedge

B. All posts shall be held plumb in augered piles with an installation template. The template shall be adjustable for horizontal placement, vertical placement and plumbness. The template shall remain in place for a minimum of 12 hours after post installation.

C. Shimming of the panels above the pile and beneath the bearing pads is permitted up to a maximum of 1-1/2”. Shims must be either stainless steel (type 304 or 316) or engineered polymer (copolymer or multipolymer) plastic with a minimum compressive strength of 8,000psi.

END OF SECTION

SECTION 03600
GROUTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: This Section specifies the grouting of the annular space between the host pipe and the new liner and the grouting of the space left void in the abandonment of the existing pipelines and structures. The Work consists of furnishing all labor, equipment and materials, and performing all Work connected with the placement of the cementaceous grout to fill the void.

1.02 QUALITY ASSURANCE

A. Grouting shall be performed by a crew under the direct supervision of a superintendent that has experience in grouting of this nature.

B. Storage, mixing, handling and placement shall be in accordance with manufacturer's instructions and specifications.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."

B. In addition, the following shall be submitted to the County for review and acceptance prior to construction.

1. A detailed description of equipment and operational procedures to accomplish the grouting operation.

2. Grout mixture design data, grout mixer type, grout samples, and test data.

3. A detailed description of the grouting time schedule.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 GROUT MATERIAL

A. The grout shall be a "flowable fill" consisting of a mixture of Type 1 Portland Cement, Type "F" Flyash (ASTM 618), sand and water.

The following is a suggested trial grout mixture for a 1-cubic yard yield:

Cement: 500-pounds
Fly Ash: 500-pounds
Water: 350-pounds (42-gallons)
Sand: 2,248-pounds
Darex (W.R. Grace): 3-ounces (Air Entrainment Additive or equivalent)

B. The actual grout mixture to be used shall meet the minimum requirements specified below.

C. The mixture shall contain a minimum of 500-pounds cement and minimum of 400-pounds flyash per cubic yard of grout.

D. Samples of the grout mixture when set aside in a standard concrete test mold shall show less than 1% of the mixture height of free water on the surface after standing not less than 12-hours.

E. One (1) set of 3 (three) 3-inch by 6-inch sample test cubes shall be made for each mix preparation. The minimum 28-day strength shall be no less than 1,000-psi. The minimum required slump is 5-inches. The maximum allowable slump is 9-inches. Slump should be as low as practical to maintain viscosity, proper flow, and still retain the ability to pump.

2.03 EQUIPMENT

A. All grout shall be mixed with a high shear, high-energy colloidal type mixer to achieve the best uniform density.

B. The grout shall be pumped with a non-pulsating centrifugal or tri-plex pump.

C. The mixer shall be capable of continuous mixing. Batch mixing shall not be permitted.

PART 3 - EXECUTION

3.01 GROUTING OF ABANDONED PIPE

A. Where utility pipes are to remain in place (inactive) they shall be filled with a sand/cement grout as specified herein.

B. The grouting program shall consist of pumping sand-cement grout with suitable chemical additives at pressures necessary to fill the pipe sections in order to prevent the potential for future collapse.

C. Grouting of pipes shall be in sections not exceeding 300 linear feet.

D. Grout shall be placed in a maximum of 3 stages, with the initial stage volume equal to or greater than 50% of the total volume for that section of pipe being grouted. The maximum time wait between grouting stages shall be 24-hours.

E. For each stage, mix and pump the material in one continuous process so as to avoid partial setting of some grout material during that stage; thus, eliminating voids and possible subsequent surface damage due to cave-ins.

F. Each section shall be grouted by injecting grout from the lowest point and allowing it to flow toward the highest point to displace water from the annulus and assure complete void-free coverage. Grout shall be placed through tubes installed in the bulkheads at the insertion pits or manholes. Grout tubes shall be at least 2-inch nominal diameter.

G. After the ends of each section of pipe are exposed, the entire space, not to exceed 300 linear feet end to end, shall be sealed by controlled pumping of grout until it flows from the pipe at the opposite end of the grouting. Grouting shall be carried out until the entire space is filled. The ends of these sections shall be capped and/or plugged.

H. Grout pressure in the void space is not to exceed 5-psi above maximum hydrostatic groundwater level. An open ended, highpoint tap or equivalent vent must be provided and monitored at the bulkhead opposite to the bulkhead through which grout is injected. This bulkhead will be blocked closed as grout escapes to allow the pressuring of the annular space.

3.02 FIELD QUALITY CONTROL

A. The quality of the grout, application of the equipment, and installation techniques are the responsibility of the Contractor. The review and acceptance or approval of specific mix design, equipment, or installation procedures shall in no way relieve the Contractor of his obligation to provide the final product as specified herein.

B. The County may stop the grouting operations at any time if the operation does not comply with these Specifications.

END OF SECTION

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SECTION 15066
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Provide and install high-density polyethylene (HDPE) pipe and fittings of the sizes and in the locations shown on the Drawings.

1.02 STANDARDS

A. Pipe 1/2-inches (13-mm) through 3-inches (76-mm) shall conform to AWWA C901 and the Specifications.

B. Pipe and fittings 4-inches (102-mm) through 60-inches (1,524-mm) shall conform to AWWA C906 and the Specifications.

1.02 SHOP DRAWINGS AND SUBMITTALS

C. Submittals shall be submitted to the County for review and acceptance prior to construction in accordance with the General Conditions and Section 01300 "Submittals."

D. Submit manufacturers recommended method for butt-fusing joints.

E. The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific product. Certification shall include a stress life curve per ASTM D2837.

F. Provide certification that the material is listed by the Plastic Pipe Institute in PPI TR-3 with a hydrostatic design basis of 1,600-psi (11 MPa) at 73°F. The PPI listing shall be in the name of the pipe manufacturer and shall be based on ASTM D2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.

G. The manufacturer's certification shall state that the pipe was manufactured from 1 specific resin in compliance with these Specifications. The certificate shall state the specific resin used, its source, and list its compliance to these specifications.

H. Submit certified lab data to verify specified physical properties. Certify that tests are representative of pipe supplied for this project.

I. Submit affidavit of compliance with referenced standards (e.g., AWWA C901, C906, etc.).

1.03 INSPECTION

J. All materials and installation furnished under this specification are subject to inspection by the County.

1.04 QUALITY AND WORKMANSHIP

A. The pipe and fitting manufacturer's production facilities shall be open for inspection by the County or his designated agents. During inspection, the manufacturer shall demonstrate that the facilities are capable of manufacturing the pipe and fittings required by this specification, that a quality control program meeting the minimum requirements of ASTM D3035 and ASTM F714 is in use, and that facilities for performing the tests required by this specification are in use.

1.05 DELIVERY, STORAGE, AND HANDLING

K. On site pipe storage shall meet all manufacturers' requirements.

L. Transport individual pipe lengths to the job site on padded bunks with nylon tie-down straps or padded bonding to protect the pipe. Coiled HDPE pipe shall be stored in a manner to ensure safety. Protect the pipe from sharp objects. Anchor pipe securely to prevent slippage.

M. Store individual pipe lengths on earth berms or timber cradles in the numerical order of installation. Stack the heaviest series of pipe at the bottom. Do not stack pipe in excess of 20-rows high.

N. Protect the pipe from stones and sharp objects.

O. Store fittings in their original cartons.

P. Lift pipes with handling beams or wide belt slings near the middle of joints as recommended by the pipe manufacturer. Do not use cable slings, chains, or hooks.

Q. Before installation, check pipe and fittings for cuts, scratches, gouges, buckling, kinking, or splitting. Remove any pipe section containing defects by cutting out the damaged section in a complete cylinder.

PART 2 - PRODUCTS

2.01 GENERAL

A. All material supplied shall be one of the products specified in Appendix D "List of Approved Products" appended to these technical specifications.

2.02 PIPE

A. Pipe shall have a nominal IPS (iron pipe size) or ductile iron pipe size OD. The pipe shall be homogenous throughout and free of visible cracks, holes, voids, foreign

inclusions, or other deleterious defects and shall be identical in color, density, melt index, and other physical properties throughout.

B. Pipe shall have a minimum hydrostatic design basis (HDB) of 1,600-psi (11 MPa), as determined in accordance with ASTM D2837.

C. Pipe Material

1. Pipes shall be marked in accordance with AWWA requirements (C901 Section 2.4 or C906 Section 3.1, as appropriate).

a. Air: Safety White

2. Materials used for the manufacture of polyethylene pipe and fittings shall be very high molecular weight, high-density ethylene/hexene copolymer PE 3408 polyethylene resin meeting the requirements of Table 15066-1.

Table 15066-1
Physical Property and Pipe Performance Requirements

Property	Specification	Units	Minimum Values
Material Designation	PPI/ASTM	---	PE3408
Material Classification	ASTM D1248	---	III C 5 P34
Cell Classification	ASTM D3350	---	345434C
Hardness	ASTM D2240	Shore D	64
Compressive Strength (Yield)	ASTM D695	psi	1,600
Tensile Strength @ Yield (Type IV Spec.)	ASTM D638 (2%/min)	psi	3,200
Elongation @ Yield	ASTM D638	%, min	8
Tensile Strength @ Break (Type IV Spec.)	ASTM D638	psi	3,500
Elongation @ Break	ASTM D638	%, min.	600
Modulus of Elasticity	ASTM D638	psi	110,000
ESCR:			
(Cond A, B, C: Mold. Slab)	ASTM D1693	Fo, Hrs	Fo>5,000
(Compressed Ring)	ASTM F1248	F50, Hrs	F50>1,000
Slow Crack Growth	Battelle		Fo>32

	Method	Days to Failure	Minimum Values
Impact Strength			
(IZOD) (0.125-inch thick)	ASTM D256	in-lb/in	
	(Method A)	Notch	42
Linear Thermal			
Expansion Coef	ASTM D696	in/in/°F	1.2 x 10-4
Thermal Conductivity	ASTM C177	BTU, in/	2.7
		Ft2/hrs/°F	
Brittleness Temp	ASTM D746	°F	<-180
Vicat Soft. Temp	ASTM D1525	°F	+257
NSF Listing	Standard 61	---	Listed

Note: * Standard deviation 0.01.

3. The pipe shall be extruded from pre-compounded resin. In-plant blending of resin is unacceptable.

2.03 NIPPLES AND FLANGED STUB ENDS

A. Short nipples and stub ends shall be of the same material as the HDPE pipe.

2.04 FITTINGS

A. Fittings shall be made from material meeting the same requirements as the pipe. Fittings shall be fabricated by the manufacturer of the pipe.

B. Fittings shall meet the appropriate AWWA standard for the size involved (C901 or C906) and shall be Pressure Class 160 for water main and reclaimed water main and Pressure Class 100 for wastewater force main.

C. Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked.

D. Mechanical fittings, when used, shall be specifically designed for, or tested and found to be acceptable for use with HDPE pipe.

2.05 JOINTS

A. Sections of polyethylene pipe shall be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer.

B. Butt fusion joining shall result in joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used. Extrusion welding or hot gas welding of HDPE shall not be used. Flanges, unions, grooved-couplers, transition

fittings, and some mechanical couplers may be used to connect HDPE pipe mechanically without butt-fusion only where shown in the Drawings.

PART 3 - EXECUTION

3.01 HEAT FUSION

A. Use fusion equipment specially designed for heat fusion of HDPE. The equipment utilized shall be regulated for the different melt strength materials. Compatibility fusion techniques shall be used when polyethylene of different melt indexes are fused together.

B. Use the following procedure to butt fused HDPE pipe. If a procedure noted below contradicts manufacturer's recommendations, follow the manufacturer's recommendation.

1. Maintain the proper temperature of the heater plate as recommended by the pipe manufacturer. Check it with a tempilstik or pyrometer for correct surface temperature.

2. Clean pipe ends inside and outside with a clean cotton cloth to remove dirt, water, grease, and other foreign materials.

3. Square (face) the pipe ends using the facing tools on the fusion machine. Remove all burrs, chips, and fillings before joining pipe or fittings.

4. Check the line-up of pipe ends in the fusion machine to see that pipe ends meet squarely and completely over the entire surface to be fused. The clamps shall be tight so that the pipe does not slip during the fusion process.

5. Insert the clean heater plate between the aligned ends and bring the ends firmly in contact with the plate but do not apply pressure while achieving the melt pattern. Allow the pipe ends to heat and soften. Softening depths shall be per the manufacturer's recommendation.

6. Carefully move the pipe ends away from the heater plate and remove the plate (if the softened material sticks to the heater plate, discontinue the joint, clean heater plate, square pipe ends, and start over).

7. The melted ends shall be connected rapidly but not slammed together. Apply enough pressure to form a double rollback bead to the body of the pipe around the entire circumference of the pipe about 1/8-inch (3.175-mm) to 3/16-inch (4.763-mm) wide. Pressure is necessary to cause the heated material to flow together.

8. Allow the joint to cool and solidify properly. Remove the pipe from the clamps and inspect the joint appearance.

3.02 ASSEMBLING JOINTS

A. Flanged Joints

1. Flange adapters shall be pressure rated the same as the pipe. Flange adapters shall be heat fused to the pipe as outlined in the heat fusion section.

2. Gaskets shall be used between the polyethylene flange adapters when recommended by the HDPE pipe manufacturer. Sufficient torque shall be applied evenly to the bolts to prevent leaks. After initial installation and tightening of flanged connections, allow the connections to set for a few hours then conduct a final tightening of the bolts.

3. Lubricate nuts and bolts with oil or graphite prior to installation.

4. Check operation of valves connected to molded stub end flange adapters. Insert polyethylene spacer if recommended by pipe manufacturer for clearance.

B. Mechanical Joints

1. Wipe the socket and the plain end clean. Lubrication and additional cleaning should be provided by brushing both the gasket and plain end with an approved pipe lubricant just prior to slipping the gasket onto the plain end for joint assembly. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.

2. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.

3. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Make deflection after assembly but before tightening bolts.

4. Tighten the bolts to the normal range of bolt torque as indicated in AWWA C-600 while maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.

5. When connection is being made to HDPE pipe or fittings use a welded flange to connect to fittings.

3.03 INSTALLATION

A. Installation of High-Density Polyethylene Pipe

1. All high-density polyethylene (HDPE) pipe shall be handled, stored, assembled, and installed in accordance with AWWA C906, manufacturer's recommendations, and these Specifications.

3.04 HYDROSTATIC TESTING

A. Perform hydrostatic testing for leakage prior to installation and following installation in accordance with manufacturer's written recommendations. Refer to “Testing And Testing Laboratory Services” in Section 01410.

END OF SECTION

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Appendix A
Geotechnical Engineering Report

Geotechnical Engineering Report

Orange County Pump Station 3190
Screen Wall
Orange County, Florida

April 17, 2014
Project No. H1145049

Prepared for:
Reiss Engineering, Inc.
Winter Springs, Florida

Prepared by:
Nodarse & Associates
A Terracon Company
Winter Park, Florida

April 17, 2014

Reiss Engineering, Inc.
1016 Spring Villas Pointe, Suite 2000
Winter Springs, Florida 32708

Attn: Ms. Melanie Peckham, P.E.
P: [407] 679-5358
F: [407] 679-5003
E: mdpeckham@reisseng.com

Re: Geotechnical Engineering Report
Pump Station 3190 Screen Wall
Orange County, Florida
Nodarse/Terracon Project No. H1145049

Dear Ms. Peckham:

Nodarse & Associates, a Terracon Company (Terracon) has completed the geotechnical engineering services for the above-referenced project. This study was performed in general accordance with our proposal number PH1130744 dated October 9, 2013.

This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of the proposed screen wall surrounding Pump Station 3190 at 8034 South Orange Avenue in Orange County, Florida.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Nodarse & Associates, a Terracon Company
Certificate of Authorization Number 8830

Eric A. McAra, P.E.
Project Engineer
Florida PE-69841

Jay W. Casper, P.E.
Senior Associate

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Exhibit B-2 Unified Soil Classification System

EXECUTIVE SUMMARY

A geotechnical investigation has been performed for the proposed screen wall at Pump Station 3190 at 8034 South Orange Avenue in Orange County, Florida. It is our understanding that the existing pump station is to be surrounded by a screen wall due to the proximity of the Sunrail Station. Construction of the screen wall is unknown but is assumed to be either shallow foundation or driven sheet pile. Two (2) borings, designated as TB-1 and TB-2, were performed to depths of about 20 feet below the existing ground surface within the existing pump station adjacent to where the screen wall is proposed. This report provides geotechnical engineering recommendations to assist in design of the screen wall foundation.

The subsoil conditions located around the existing pump station generally consist of organic soils and near surface groundwater table. Based on the information obtained from our geotechnical exploration, subsurface conditions encountered within the borings generally consisted of relatively clean sands. The following geotechnical considerations were identified:

- Soil conditions observed were relatively clean sands. If organic soils are observed at the wall locations, we should be notified to observe construction and provide additional recommendations, as necessary.
- Groundwater levels were found during the field exploration at depths ranging from the existing ground surface to a depth of about 2 feet below existing grade. Seasonal high groundwater levels are expected to be at or above existing grade.
- Depending on groundwater levels at the time of wall construction, dewatering may be required to achieve adequate compaction of the subgrade soils.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **GENERAL COMMENTS** should be read for an understanding of the report limitations.

GEOTECHNICAL ENGINEERING REPORT
ORANGE COUNTY PUMP STATION 3190 – SCREEN WALL
ORANGE COUNTY, FLORIDA

Terracon Project No. H1145049
April 17, 2014

1.0 INTRODUCTION

A geotechnical investigation has been performed for the proposed screen wall at Pump Station 3190 at 8034 South Orange Avenue in Orange County, Florida, as shown on the Topographic Vicinity Map included as Exhibit A-1 in Appendix A. Two (2) borings, designated as TB-1 and TB-2, were performed to depths of about 20 feet below the existing ground surface near the proposed wall locations. Logs of the borings along with a boring location plan are included in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to potential development of the site regarding:

- subsurface soil conditions
- groundwater conditions
- foundation design recommendations
- site and subgrade preparation

2.0 PROJECT INFORMATION

2.1 Project Description

The project consists of installing a new screen wall around the existing Pump Station 3190 at 9034 South Orange Avenue in Orange County, Florida. The foundation construction of the screen wall is unknown at this time, but is assumed to either be constructed as a shallow foundation or driven sheet pile.

2.2 Site Location and Description

ITEM	DESCRIPTION
Location	The project site is located on South Orange Avenue adjacent to the SunRail Station in Orange County, Florida

ITEM	DESCRIPTION
Current Ground Cover	The project area is currently an existing pump station. Based on our knowledge of the area surrounding the site, organic soils may be present within the area.
Existing Topography	Based on the USGS topographic quadrangle map entitled, "Pine Castle, Florida," natural ground surface elevation is about +95 feet, and the site is located within and low-lying area adjacent to a wetland located to the west of the site.

3.0 SITE CONDITIONS

3.1 USDA/NRCS Soil Survey

The Soil Survey of Orange County, Florida as prepared by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS; later renamed the Natural Resource Conservation Service - NRCS), identifies the soil types along the subject alignment as: *Samsula Muck (40)* and *Sanibel muck (42).* It should be noted that the Soil Survey is not intended as a substitute for site-specific geotechnical exploration; rather it is a useful tool in planning a project scope in that it provides information on soil types likely to be encountered. Boundaries between adjacent soil types on the Soil Survey maps are approximate (included in Appendix as Exhibit A-2). Descriptions of the mapped soil units are included in Appendix A as Exhibit A-3.

3.2 Typical Profile

Based on the results of the borings, subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/ Density
1	13 feet	Fine sand with silty to silty fine sand (SP-SM)(SM)	Loose to Medium Dense
2	at least 20 feet	Fine sand with silty to silty fine sand (SP-SM)(SM)	Medium Dense

Conditions encountered at each boring location are indicated on the individual boring profiles on Exhibit A-4. Stratification boundaries on the boring profiles represent the approximate location of changes in soil types; the in-situ transition between materials may be gradual. Details for each of the borings can be found in profile form in Appendix A of this report. Descriptions of our field exploration are included as Exhibit A-5 in Appendix A.

3.3 Groundwater

The boreholes were observed during drilling for the presence and level of groundwater. Groundwater was observed in the borings, ranging from the existing ground surface to a depth of 2 feet below existing grade.

It should be recognized that fluctuations of the groundwater table will occur due to seasonal variations in the amount of rainfall, runoff, adjacent construction and other factors not evident at the time the boring was performed. Therefore, groundwater levels during construction or at other times in the future may be higher or lower than the levels indicated on the boring logs.

We estimate that during the June through October wet season, with rainfall and recharge at a maximum, groundwater levels will be at or above existing grade at the screen wall location. Our estimates of the seasonal groundwater conditions are based on the USDA Soil Survey, the encountered soil types (including the encountered mottling), and the encountered water levels. The estimated normal seasonal high groundwater tables are included in the following table and on the boring logs.

Boring #	Approximate depth to encountered water table (feet)	Approximate depth to estimated normal seasonal high groundwater table (feet)
TB-1	2.0	0.0
TB-2	0.0	+0.0

Estimates of the normal seasonal high water table presented in this report are based on and limited by the data collected during our geotechnical exploration, and the referenced published documents. Estimates of the normal seasonal high assume normal precipitation volumes and distribution. These seasonal water table estimates do not represent the temporary rise in water table that occurs immediately following a storm event, including adjacent to other stormwater management facilities. This is different from static groundwater levels in wet ponds and/or drainage canals which can affect the design water levels of new, nearby ponds. The seasonal high water table may vary from normal when affected by extreme weather changes, localized or regional flooding, karst activity, future grading, drainage improvements, or other construction that may occur on or around the site following the date of this report.

4.0 LABORATORY TESTING

The laboratory testing program included single sieve (-200) analysis, moisture content and corrosion series testing. The results of the corrosion series and redox potential testing are presented on Table 2 in Appendix A. The results of the sieve analysis and moisture content tests are presented adjacent to the borings on Exhibit A-4 in Appendix A.

4.1 Environmental Classification

Two (2) soil samples were obtained from the borings for corrosion testing to determine subsurface environmental conditions. The environmental classifications are based on the 2013 FDOT Structures Design Guidelines. Testing included pH, chlorides, sulfates and resistivity tests. The environmental classification should be classified as slightly aggressive for use in selecting an appropriate class of concrete and steel. The corrosion series test results are summarized in Table 1 in the Appendix.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on the project characteristics previously described, the data obtained in our field exploration and our experience with similar subsurface conditions and construction types.

If the proposed screen wall location or construction installation method are significantly different from those previously described, or if subsurface conditions different from those disclosed by the borings are encountered during construction, we should be notified immediately so that we might review and modify, if necessary, the following recommendations in regards to such changes. The general guidelines included in this report are not intended to supersede any more stringent requirements mandated by other municipal specifications.

5.1 General Site Preparation

Based on soil conditions observed in the borings, organic soils which may have been on the site prior to development appear to have been removed during the lift station construction.

The following general procedures are recommended for site preparation:

- All excavations should be performed in accordance with appropriate Occupational Safety and Health Administration (OSHA) excavation standards.

- If safe side slopes cannot be maintained or are not desired due to other considerations, a properly designed braced excavation, trench shield, sheet piling, or chemically grouted wall would be required for stable excavations. All shields, shoring and bracing systems, or sheet piling should be designed and reviewed by an experienced Professional Engineer registered in the State of Florida. Adjacent traffic loads, and induced vibrations among other factors should be included in the design of these stabilization systems.

- Groundwater was observed from the existing ground surface to a depth of 2 feet below existing grade. Seasonal high groundwater levels are anticipated at or near the existing ground surface at the wall location. Based on this information if a shallow foundation for the screen wall is preferred alternative, dewatering will be required to facilitate construction, backfilling, and compaction in the dry.

5.2 Earthwork

Prior to construction of the wall foundations, all vegetation, topsoil, and any otherwise unsuitable material should be removed below the proposed footing areas. Wet or dry material should either be removed or moisture conditioned and re-compacted. After stripping and grubbing and achieving cut grades, the exposed surface should be proofrolled where possible to aid in locating loose or soft areas. Unstable soil (pumping) should be removed or moisture conditioned and compacted in place prior to placing fill.

After initial proofrolling and compaction, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of the foundations. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and re-compacted prior to floor slab and pavement construction.

5.3 Foundations

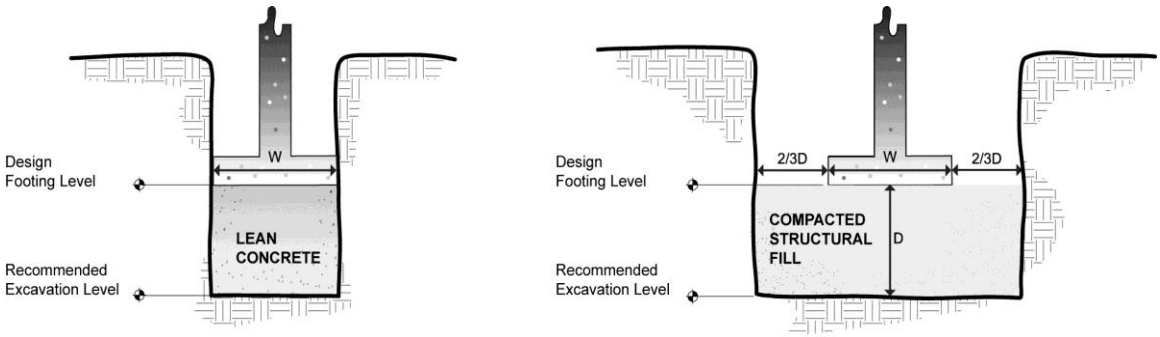
At this time, it is assumed that the foundation alternates for the screen wall are anticipated to be a shallow foundation or driving sheet pile. Based on this, soil parameters shown on Table 1 in the Appendix can be used for design.

The following should be considered during construction:

- If a shallow foundation is considered, dewatering will be required for construction of the screen wall foundation. Dewatering the area will require the use of a properly designed well point system. Other dewatering systems utilizing sumps within shored or braced excavations may also be feasible. However, design of shoring/sump systems should be carefully evaluated with regard to blow outs of the excavation bottom due to unbalanced hydrostatic conditions. The Contractor should be allowed to review the soil conditions to determine the most feasible dewatering system for the pump station area.

- Although not observed during the field exploration, unsuitable material (organics, muck, debris, etc.), if encountered should be removed below the screen wall footing, to provide a stable construction platform, and replaced with well-draining granular sands with fines contents of 5 percent or less passing the No. 200 U.S. Standard sieve by weight. The soils below the footing base should be compacted to a firm and unyielding state. If depths of removal appear to be excessive, Terracon should be contacted to review the conditions.

- Overexcavation below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of overexcavation depth below footing base elevation. The overexcavation should then be backfilled up to the footing base elevation with granular material placed in lifts of 6 inches or less in loose thickness and compacted to at least 95 percent of the material's modified effort maximum dry density (ASTM D-1557). The overexcavation and backfill procedures are described in the figures below.



Lean Concrete Backfill **Overexcavation / Backfill**

NOTE: Excavations in sketches shown vertical for convenience. Excavations should be sloped as necessary for safety.

- The base of all foundation excavations should be free of water and loose soil prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed or saturated, the affected soil should be removed prior to placing concrete. It is recommended that Terracon be retained to observe and test the soil foundation bearing materials.

- Compaction of soils should be accomplished in lift thicknesses no greater than 6 inches and can likely be accomplished with a small plate or hand guided drum type vibratory compactor. The fill material should consist of relatively clean granular sands with no more than 5 percent passing the No. 200 U.S. Standard sieve by weight.

- If compaction difficulties arise during construction, the Geotechnical Engineer should be consulted to provide further recommendations.

6.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

TABLES

TABLE 1
SOIL PROPERTIES
ORANGE COUNTY PUMP STATION 3190
SCREEN WALL
CONTRACT NO. Y11-902B
ORANGE COUNTY, FLORIDA
TERRACON PROJECT NO. H1145049

Soil Type (sand or clay)	Sand
Soil Friction Angle ($ø_{soil}$)	32°
Soil Cohesion (c_{soil})	0 psf
Moist Soil Unit Weight (above Watertable)*	110 pcf
Effective Soil Unit Weight (below Watertable)	48 pcf
Average N-Value	11 bpf
Depth of Water Table	1 foot

Description	Wall Footing		
Net allowable bearing pressure [1]	1,200 psf	1,400 psf	1,700 psf
Minimum width	18 inches	36 inches	60 inches
Minimum embedment below finished grade [2]	18 inches		
Compaction requirements [4]	95 percent of the materials maximum Modified Proctor dry density for a depth of 12 inches below footing.		
Minimum Testing Frequency	One field density test per 50 linear feet for a minimum depth of 1 foot below the footing subgrade.		
Approximate total settlement [3]	<1 inch		
Estimated differential settlement [3]	<1/2 inch over 50 feet		

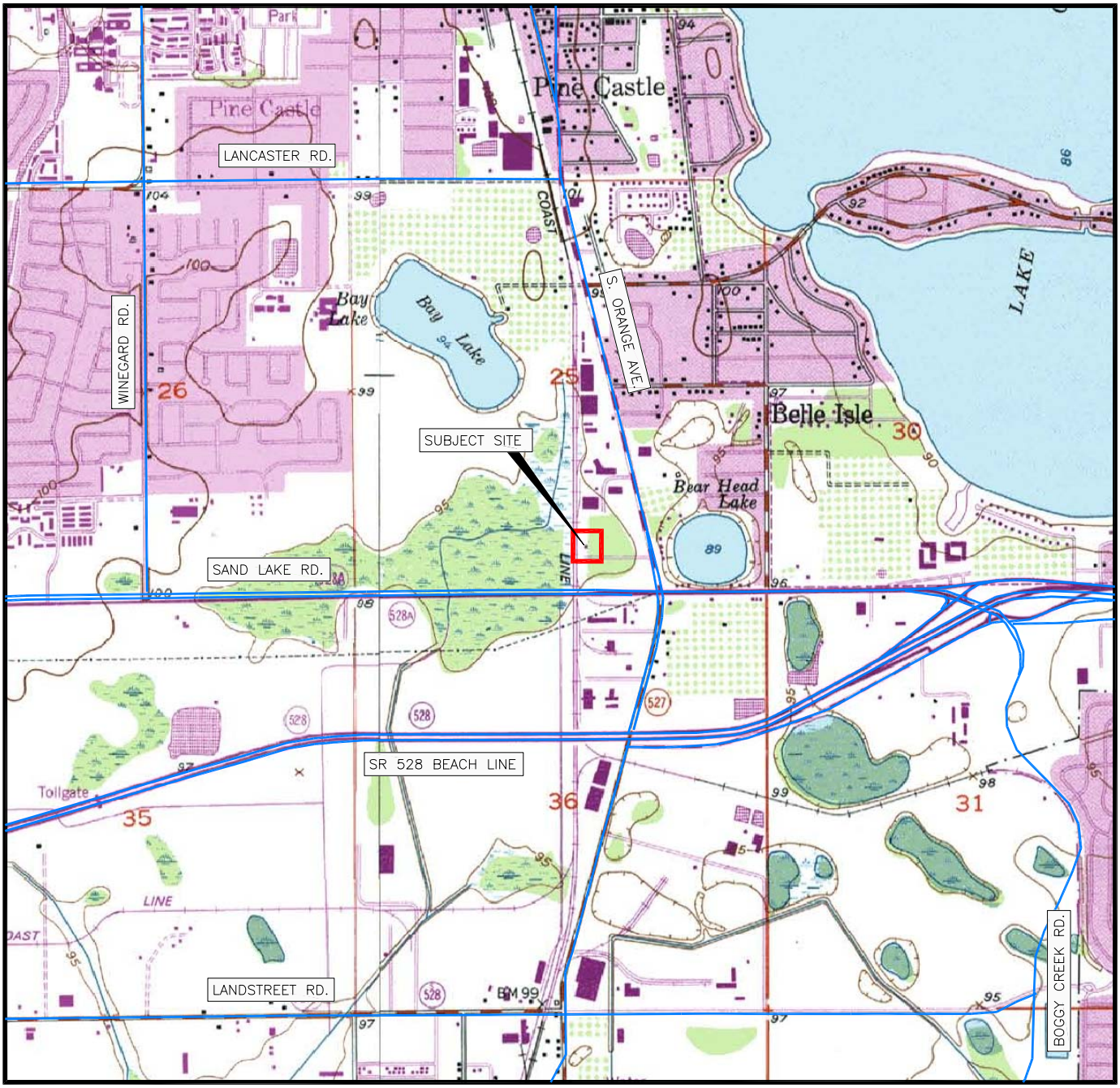
1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Assumes any unsuitable fill or soft soils, if encountered, will be undercut and replaced with engineered fill.
2. For erosion protection and to reduce effects of seasonal moisture variations in subgrade soils.
3. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations. The above settlement estimates have assumed that the maximum wall load is approximately 10 klf.
4. Proper dewatering system will be necessary to facilitate compaction.

TABLE 2
CORROSION SERIES TESTING RESULTS FOR SOILS
ORANGE COUNTY PUMP STATION 3190
SCREEN WALL
ORANGE COUNTY, FLORIDA
TERRACON PROJECT NO. H1145049

Boring Number	Sample Depth (feet)	pH	Minimum Resistivity (ohm-cm)	Chlorides (ppm)	Sulfates (ppm)	Redox Potential (mV)	Sulfides	Substructural Environmental Classification	
								Steel	Concrete
TB-1	6 - 8	7.9	4,300	60	63	239	trace	Slightly Aggressive	Moderately Aggressive
TB -2	0 - 2	7.8	7,800	60	<5	228	trace	Slightly Aggressive	Slightly Aggressive

APPENDIX A
FIELD EXPLORATION

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

KILOMETERS 1 .5 0 1 2
1000 0 1000 2000
MILES 1 .5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

SECTION: 25
TOWNSHIP: 23 SOUTH
RANGE: 29 EAST

LAKE JESSAMINE, FLORIDA
ISSUED: 1953 REVISED: 1980

PINE CASTLE, FLORIDA
ISSUED: 1953 REVISED: 1980

7.5 MINUTE SERIES (QUADRANGLE)

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Apr16, 2014-2:25pm

Project Mngr:	EAM
Drawn By:	EAM
Checked By:	SM
Approved By:	JWC

Project No.	H1145049
Scale:	AS SHOWN
File No.	H1145049-1
Date:	4-16-14

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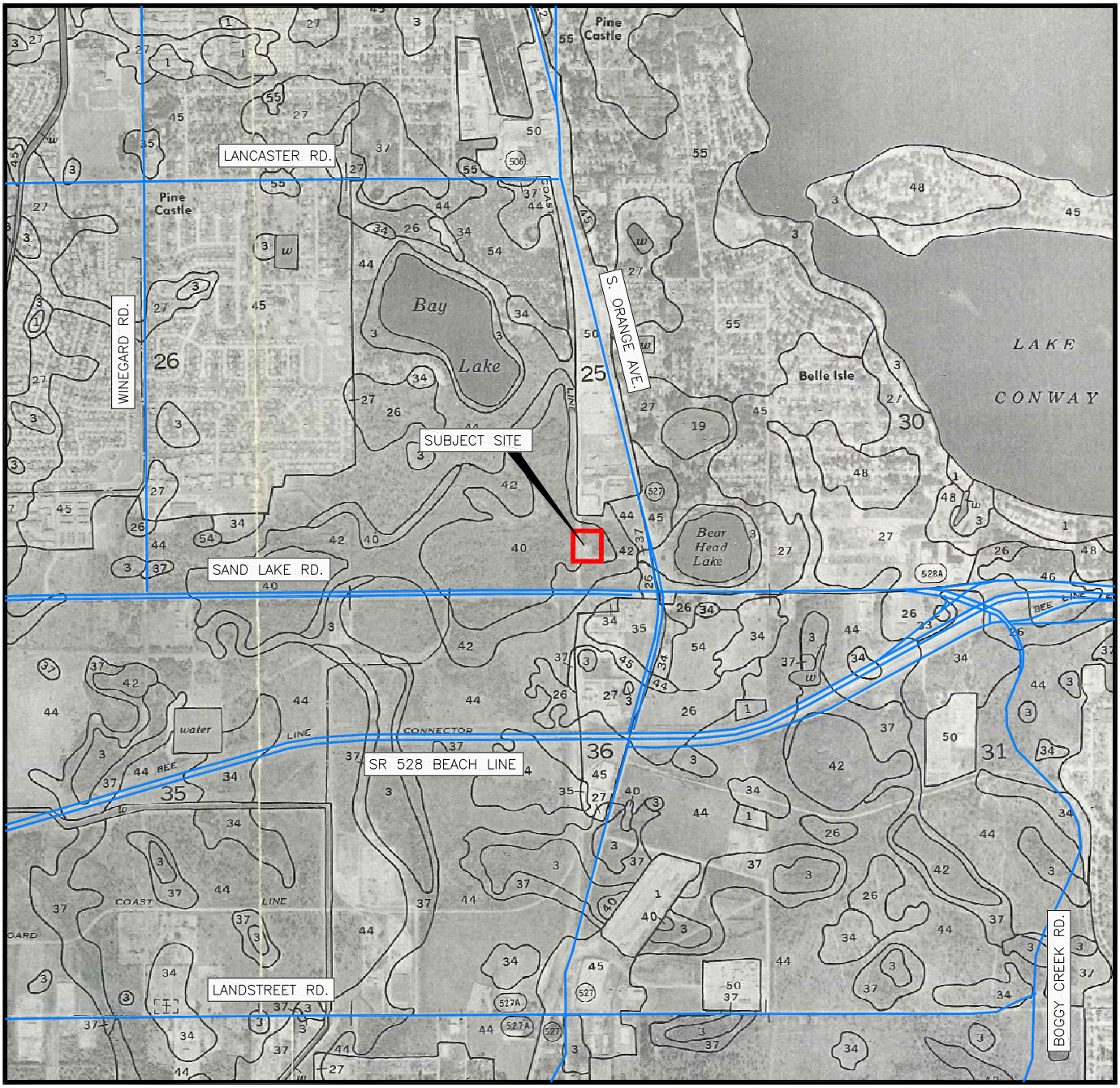
TOPOGRAPHIC VICINITY MAP
GEOTECHNICAL ENGINEERING REPORT
PUMP STATION 3190 (ORANGE AVENUE) SCREEN WALL
ORANGE COUNTY, FLORIDA

EXHIBIT
A-1



SCALE 1" = 2000'

FEET

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

U.S.D.A. SOIL SURVEY FOR ORANGE COUNTY, FLORIDA
ISSUED: 1989

N

ORANGE COUNTY SOILS MAP INDEX	
40	SAMSULA MUCK
42	SANIBEL MUCK

SECTION: 25
TOWNSHIP: 23 SOUTH
RANGE: 29 EAST

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Project Mngr:	EAM
Drawn By:	SW
Checked By:	EAM
Approved By:	JWC

Project No.	H1145049
Scale:	AS SHOWN
File No.	H1145049-2
Date:	4-16-14

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U.S.D.A. SOILS MAP
GEOTECHNICAL ENGINEERING REPORT
PUMP STATION 3190 (ORANGE AVENUE) SCREEN WALL
ORANGE COUNTY, FLORIDA

EXHIBIT
A-2

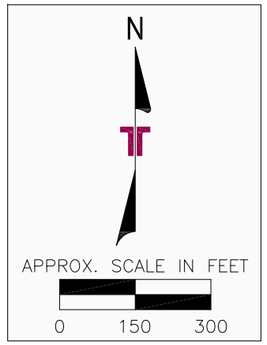
Soil Survey Descriptions

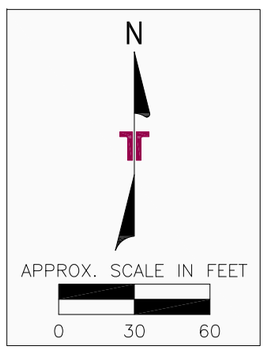
40 – Samsula muck. This soil type is nearly level and very poorly drained. It is typically found in freshwater marshes and swamps. In its natural state, groundwater is at or above the surface of this soil type for 6 to 9 months or more except during extended dry periods. This soil type exists as muck (USCS classification PT, or "peat") to a typical depth of 40 inches (3.3 feet); typical organic contents of this muck layer are greater than 20 percent. Thereafter, to the maximum defined depth of 80 inches (6.7 feet), this soil type is sand to silty sand (USCS classification SP to SM).

42 –Sanibel muck. This soil type is nearly level and very poorly drained. It is typically found in depressions, freshwater swamps and marshes, and poorly defined drainageways. In its natural state, groundwater is ponded atop this soil type for 6 to 9 months of years with normal rainfall; the groundwater table fluctuates between the surface and a depth of 10 inches (0.8 feet) for 2 to 6 months. A surficial organic layer is normally associated with this soil type, approximately 11 inches (0.9 feet) thick. Typical organic contents of the organic layer range from 20 to 50 percent. Beneath the surficial organic layer, Sanibel soils are predominantly sandy to the maximum defined depth of 80 inches (6.7 feet).

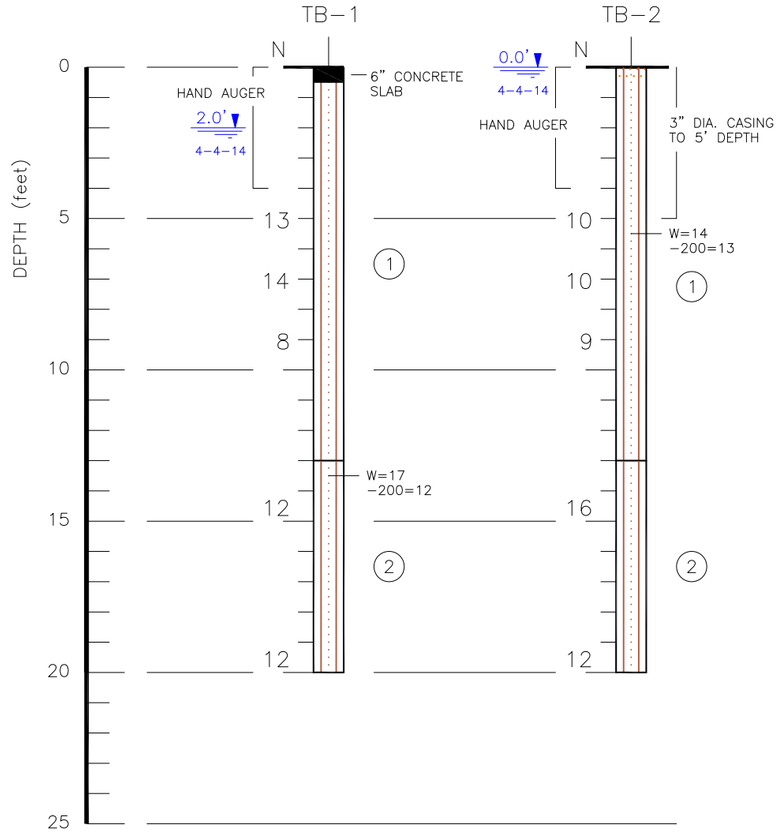
GOOGLE EARTH IMAGE 1–22–13

ORANGE COUNTY PROPERTY APPRAISER IMAGE 4–16–14





APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING



1	DARK BROWN FINE SAND WITH SILT TO SILTY FINE SAND (SP–SM)(SM)
2	LIGHT BROWN FINE SAND WITH SILT TO SILTY FINE SAND (SP–SM)(SM)
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
0.0' ▼ 4–4–14	OBSERVED GROUNDWATER LEVEL (feet) (DATE NOTED)
N	STANDARD PENETRATION TEST RESISTANCE IN BLOWS PER FOOT
W	NATURAL MOISTURE CONTENT (%)
–200	FINES PASSING No. 200 SIEVE (%)

Project Mngr:	EAM
Drawn By:	SW
Checked By:	EAM
Approved By:	JWC
Project No.	H1145049
Scale:	AS SHOWN
File No.	H1145049-3
Date:	4-16-14

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SOIL BORING LOCATION PLAN AND BORING PROFILES
GEOTECHNICAL ENGINEERING REPORT
PUMP STATION 3190 (ORANGE AVENUE) SCREEN WALL
ORANGE COUNTY, FLORIDA

EXHIBIT
A-4

Field Exploration Description

The boring locations were laid out at the project site by Terracon personnel. The locations indicated on the attached diagram are approximate and were measured by pacing distances and estimating right angles. The locations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

The SPT soil borings were drilled with a rotary drilling rig equipped with an automatic hammer. The boreholes were advanced with a cutting head and stabilized with the use of bentonite (drillers' mud). Soil samples were obtained by the split spoon sampling procedure in general accordance with the Standard Penetration Test (SPT) procedure. In the split spoon sampling procedure, the number of blows required to advance the sampling spoon the last 12 inches of an 18-inch penetration or the middle 12 inches of a 24-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N). This value is used to estimate the in-situ relative density of cohesionless soils and the consistency of cohesive soils. The sampling depths and penetration distance, plus the standard penetration resistance values, are shown on the boring logs.

A CME automatic SPT hammer was used to advance the split-barrel sampler in the borings performed on this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Field logs of each boring were prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. The boring logs included with this report represent an interpretation of the field logs and include modifications based on laboratory observation of the samples. Portions of the samples from the borings were sealed in glass jars to reduce moisture loss, and then the jars were taken to our laboratory for further observation and classification. Upon completion, the boreholes were backfilled with the site soil.

APPENDIX B
SUPPORTING DOCUMENTS

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-$^3/_8$" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube – 2" O.D., 3" O.D., unless otherwise noted	PA:	Power Auger (Solid Stem)
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB	Wash Boring or Mud Rotary

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	WS:	While Sampling	N/E:	Not Encountered
WCI:	Wet Cave in	WD:	While Drilling	ESH:	Estimated Seasonal High Groundwater
DCI:	Dry Cave in	BCR:	Before Casing Removal	ESL:	Estimated Seasonal Low Groundwater
AB:	After Boring	ACR:	After Casing Removal		

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	0 – 1	Very Soft
500 – 1,000	2 – 3	Soft
1,000 – 2,000	4 – 6	Medium Stiff
2,000 – 4,000	7 – 12	Stiff
4,000 – 8,000	13 – 26	Very Stiff
8,000+	> 26	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	Relative Density
0 – 3	Very Loose
4 – 9	Loose
10 – 29	Medium Dense
30 – 50	Dense
> 50	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	≥ 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	#4 to #200 sieve (4.75 to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 – 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 – 10
Medium	11 – 30
High	> 30

Rev. 4/10

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K,L,M,N] / Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K,L,M,P] / Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

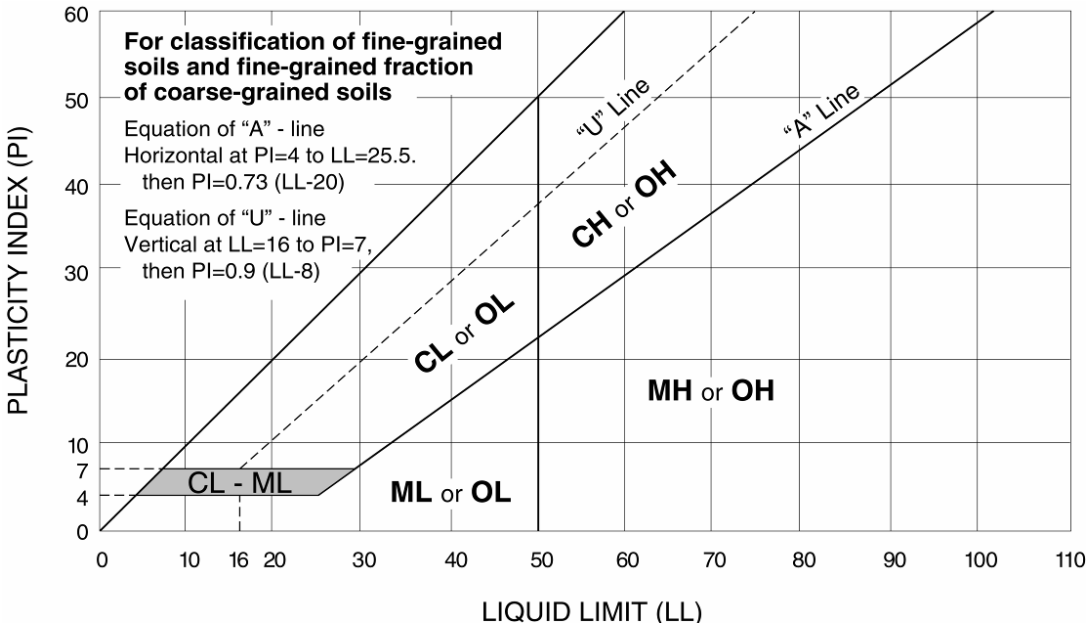
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Appendix D
List of Approved Products

APPENDIX D **LIST OF APPROVED PRODUCTS - TRANSMISSION SYSTEMS** **FEBRUARY 11, 2011**

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Air Release	ARV Enclosure	**All ARV above ground enclosures shall be vented with tamper proof locking device**						
		Water Plus Polyethylene Enclosure	131632 H30-B	Blue 44" Tall	131632 H30-P	Pantone 44"	131632 H30-G	Green 44" Tall
			171730 H40-B	Blue 30" Tall	171730 H40-P	Pantone 30"	171730 H40-G	Green 30" Tall
		Hot Box Vent Guard Fiberglass Enclosure	AVG2036 Encl GP3232 Base	Blue 36" Tall	AVG2036 Encl GP3232 Base	Pantone 36" Tall	AVG2036 Encl GP3232 Base	Green 36" Tall
			AVG2041 Encl GP3232 Base	Blue 41" Tall	AVG2041 Encl GP3232 Base	Pantone 41" Tall	AVG2041 Encl GP3232 Base	Green 41" Tall
		Safety-Guard/Hydro Guard	15100 Encl	Blue 34" Tall	15100 Encl	Pantone 34" Tall	15100 Encl	Green 34" Tall
	Air Release Valves	**Air Release Valves shall be Combination Type, 316 SS**						
		ARI	D-040SS	Combination	D-040SS	Combination	D-020 (SS)	Combination
		H-TEC	NA	NA	NA	NA	986 (316SS)	Combination
		Vent-O-Mat	Series RBX DN50	2"	Series RBX DN50	2"	RGX series	
	ARV Vault	**Air Release Valve Frame and Cover**						
		US Foundry	NA	NA	NA	NA	USF 7665-HH-HJ	
Blow Off	Auto Blow Off	**Automatic Blow Off Valve**						
		Hydro Guard	HG-1 Standard Unit	Automatic	NA	NA	NA	NA
	Blow Off Valve	**Blow Off Valve - Fits standard 5-1/4 inch Valve Box**						
		Kupferle Foundry Co	Truflo Series TF #550		Truflo Series TF #550		NA	NA
		Water Plus Corp	The Hydrant Plus Series VB 2000B		The Hydrant Plus Series VB 2000B		NA	NA
Casing Seals / Spacers	Casing End Seals	**Casing End Seals. Annular space between pipe and steel casing shall be brick and mortar with end seals to secure ends.**						
		Advance Products	Model AC and AW		Model AC and AW		Model AC and AW	
		BWM Company	Model WR and PO		Model WR and PO		Model WR and PO	
		Cascade Water Works	Model CCES		Model CCES		Model CCES	
		CCI Pipeline	Model ESW and ESC		Model ESW and ESC		Model ESW and ESC	
		Pipeline Seal & Insulator, Inc (PSI)	Model C and W		Model C and W		Model C and W	
		Power Seal	Model 4810ES		Model 4810ES		Model 4810ES	

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Casing Seals / Spacers	Casing spacer	**Casing spacers shall be a min. 8-inches wide for pipe 12" Dia or less or min. 12-inches wide for pipe 16 or greater , shall have a minimum 14 gauge 304 stainless steel shell/band, minimum 10 gauge 304 reinforced risers; minimum thickness of 0.090 EPDM or PVC interior liners, glass reinforces polymer or ultra high molecular weight polyethylene and 304 stainless bolts, nuts and washers.**						
		Advance Products	SSI8 / SSI12		SSI8 / SSI12		SSI8 / SSI12	
		BWM Company	BWM-SS-8 / SS-12		BWM-SS-8 / SS-12		BWM-SS-8 / SS-12	
		Cascade Water Works	Series CCS 8" / 12"		Series CCS 8" / 12"		Series CCS 8" / 12"	
		CCI Pipeline	Model CCS8 / CSS12		Model CCS8 / CSS12		Model CCS8 / CSS12	
		Pipeline Seal & Insulator, Inc (PSI)	Series S8G-2 / S12G-2		Series S8G-2 / S12G-2		Series S8G-2 / S12G-2	
Coatings	Exterior Coatings for Exposed Metal Assets	**Coatings: Aerial pipe, hydrants, above ground piping, fittings, valves and Appurtenances - System 1 Zinc / Urethane / Fluoropolymer application and color code per Section 3119 Coatings & Linings. Coating shall not be in contact with Potable water unless NSF 61 approved.**						
		Carboline	Carbozinc 621	3.0 - 8.0 mils	Carbozinc 621	3.0 - 8.0 mils	Carbozinc 621	3.0 - 8.0 mils
			Carbothane 133 HB	3.0 -5.0 mils	Carbothane 133 HB	3.0 -5.0 mils	Carbothane 133 HB	3.0 -5.0 mils
			Carboxane 950	2.0 - 3.0 mils	Carboxane 950	2.0 - 3.0 mils	Carboxane 950	2.0 - 3.0 mils
		Tnemec	Zinc Series 90-97	2.5 - 3.5 mils	Zinc Series 90-97	2.5 - 3.5 mils	Zinc Series 90-97	2.5 - 3.5 mils
			Typoxy Series 27WB	4.0 -14.0 mils	Typoxy Series 27WB	4.0 -14.0 mils	Typoxy Series 27WB	4.0 -14.0 mils
			EnduraShield Series73	2.0 - 3.0 mils	EnduraShield Series73	2.0 - 3.0 mils	EnduraShield Series73	2.0 - 3.0 mils
			Hydroflon Series 700	2.0 - 3.0 mils	Hydroflon Series 700	2.0 - 3.0 mils	Hydroflon Series 700	2.0 - 3.0 mils
	Exterior Coatings for Exposed Metal Assets	**Coatings: Aerial pipe, hydrants, above ground piping, fittings, valves and Appurtenances - System 2 Zinc / Epoxy / Urethane application and color code per Section 3119 Coatings & Linings. Coating shall not be in contact with Potable water unless NSF 61 approved.**						
		Carboline	Carbozinc 621	3.0 - 8.0 mils	Carbozinc 621	3.0 - 8.0 mils	Carbozinc 621	3.0 - 8.0 mils
			Carboguard 60	4.0 -6.0 mils	Carboguard 60	4.0 -6.0 mils	Carboguard 60	4.0 -6.0 mils
			Carboxane 950	2.0 - 3.0 mils	Carboxane 950	2.0 - 3.0 mils	Carboxane 950	2.0 - 3.0 mils
		Tnemec	Zinc Series 90-97	2.5 - 3.5 mils	Zinc Series 90-97	2.5 - 3.5 mils	Zinc Series 90-97	2.5 - 3.5 mils
			Typoxy Series 27WB	4.0 -14.0 mils	Typoxy Series 27WB	4.0 -14.0 mils	Typoxy Series 27WB	4.0 -14.0 mils
			Hi-Build Epoxoline II Series N69	4.0 - 10.0 mils	Hi-Build Epoxoline II Series N69	4.0 - 10.0 mils	Hi-Build Epoxoline II Series N69	4.0 - 10.0 mils
			EnduraShield Series73	2.0 - 3.0 mils	EnduraShield Series73	2.0 - 3.0 mils	EnduraShield Series73	2.0 - 3.0 mils
		PPG / Ameron	Amercoat 68HS	Min 3.0 mils	Amercoat 68HS	Min 3.0 mils	Amercoat 68HS	Min 3.0 mils
			Amercoat 385	4.0 - 6.0 mils	Amercoat 385	4.0 - 6.0 mils	Amercoat 385	4.0 - 6.0 mils
			Amercoat 450H	2.0 - 3.0 mils	Amercoat 450H	2.0 - 3.0 mils	Amercoat 450H	2.0 - 3.0 mils

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Fittings	Fittings	**Ductile Iron Fittings C153 SSB / C110 FLG: (Water & Reclaimed Water fittings shall cement lined or holiday free fusion bonded epoxy lined) (Wastewater fittings interior shall be Protecto 401 and holiday free)**						
		American	30" & up	FBE / Cement	30" & up	FBE / Cement	30" & up	Protecto 401
		Sigma		FBE / Cement		FBE / Cement		Protecto 401
		Star		FBE / Cement		FBE / Cement		Protecto 401
		Tyler Union & Clow		FBE / Cement		FBE / Cement		Protecto 401
Flow	Flow Meter	**Flow Meters With Replaceable Sensors**						
		EMCO	NA	NA	NA	NA	Unimag 4411E	
Hydrants	Hydrants	**Hydrants Shall open left, 1-1/2 Pentagon operating nut, NST hose & pumper thread, rotate 360 degrees, closed drains, epoxy on shoe in & out and 304 SS nuts & bolts below ground.**						
		American Flow Control	B-84-B (6 inch)		NA	NA	NA	NA
		Clow	Medallion 2545		NA	NA	NA	NA
		Mueller	Super Centurion 250		NA	NA	NA	NA
Joint Restraints	Ductile iron pipe MJ Restraints	**Mechanical Joint Wedge-action Restraining Gland, Epoxy Coated Restrain ductile iron pipe to mechanical joint fittings, pipe and appurtenances.**						
		EBAA Iron Inc	Megalug Series 1100		Megalug Series 1100		Megalug Series 1100	
		Ford / Uni-Flange	UFR-1400		UFR-1400		UFR-1400	
		Sigma	OneLok Series SLD/SLDE		OneLok Series SLD/SLDE		OneLok Series SLD/SLDE	
		Smith Blair	Cam Lok Series 111		Cam Lok Series 111		Cam Lok Series 111	
		Star	Star Grip Series 3000		Star Grip Series 3000		Star Grip Series 3000	
		Tyler Union	TufGrip Series TLD		TufGrip Series TLD		TufGrip Series TLD	
	DIP Bell Joint Restraints (4"-12") (New & Existing)	**Bell Joint Restraints for Ductile Iron Pipe (4"-12") (New & Existing) - All restraints split serrated on bell and spigot ends. Pipe 16" and greater shall have restraint gaskets or locking bells. (Wastewater only for restraint of existing DIP FM)**						
		EBAA Iron Inc	Tru-Dual Series 1500TD		Tru-Dual Series 1500TD		Tru-Dual Series 1500TD	
		Ford / Uni-Flange	Uni-Flange Series 1390C		Uni-Flange Series 1390C		Uni-Flange Series 1390C	
		Sigma	PV-Lok Series PWP-C		PV-Lok Series PWP-C		PV-Lok Series PWP-C	
		Smith Blair	Bell-Lock Series 165		Bell-Lock Series 165		Bell-Lock Series 165	
		Star	StarGrip Series 3100S		StarGrip Series 3100S		StarGrip Series 3100S	
		Tyler Union	TufGrip-Series 300C		TufGrip-Series 300C		TufGrip-Series 300C	
	DIP Bell Joint Restraints (16" & Greater)	**Ductile Iron Pipe Bell Joint Restraints for Ductile Iron Pipe (16" & Greater) - All restraints shall have a split back-up ring for the bell and a serrated or wedge action gland for the spigot end. New installation for water & reclaimed water piping 16" and greater shall have restraint gaskets or locking bells.**						
		EBAA Iron Inc	Series 1100HD	Existing Only	Series 1100HD	Existing Only	Series 1100HD	Existing Only
		Sigma	Series SSLDH	Existing Only	Series SSLDH	Existing Only	Series SSLDH	Existing Only
		Star	Series 3100S	Existing Only	Series 3100S	Existing Only	Series 3100S	Existing Only

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Joint Restraints	Ductile iron pipe Bell Joint Restraint Gaskets and Locking Bell (4" & Above)	**Bell Joint Restraint Gaskets and Locking Bell (4" & Above) Stainless Steel locking wedges built into the gasket-rubber. ANSI/AWWA C111/A21.11 Standard for Rubber-Gasket Joints for Ductile Iron Pressure Pipe. Ductile Iron Bell Joint Restraint for Push-On Pipe- Locking bell joint system that prevents joint separation and allows for joint deflection. Bells shall be painted red to verify restrained gasket.**						
		American	Fast Grip Gasket	Gasket	Fast Grip Gasket	Gasket	NA	NA
			Flex-Ring Joint	Bell Lock	Flex-Ring Joint	Bell Lock	NA	NA
			Lok-Ring Joint	Bell Lock	Lok-Ring Joint	Bell Lock	NA	NA
		Griffin	Talon RJ Gasket	Gasket	Talon RJ Gasket	Gasket	NA	NA
			Snap-Lok	Bell Lock	Snap-Lok	Bell Lock	NA	NA
		McWane Inc. DI Pipe Group	Sure Stop 350 Gasket	Gasket	Sure Stop 350 Gasket	Gasket	NA	NA
			Thrust-Lock	Bell Lock	Thrust-Lock	Bell Lock	NA	NA
			TR-Flex	Bell Lock	TR-Flex	Bell Lock	NA	NA
			Super-Lock	Bell Lock	Super-Lock	Bell Lock	NA	NA
		US Pipe	Field Lok 350 Gasket	Gasket	Field Lok 350 Gasket	Gasket	NA	NA
			Field Lok Gasket	Gasket	Field Lok Gasket	Gasket	NA	NA
			TR-Flex	Bell Lock	TR-Flex	Bell Lock	NA	NA
			HP Lok Restraint Joint	Bell Lock	HP Lok Restraint Joint	Bell Lock	NA	NA
	SS to DIP Transition Restraint	**SS to DIP Transition Restraint -Flanged stainless steel pipe from Wetwell to Valve box restrained joint transition (epoxy coated, SS hardware) Flg x PE RJ.**						
		EBAA Iron Inc	NA	NA	NA	NA	Megaflange 2100	
		Sigma	NA	NA	NA	NA	SigmaFlange with One Lock SLDE	
		Smith Blair	NA	NA	NA	NA	911 Flange - Lock Restrained FCA	
	PVC Pipe MJ Restraints	**Mechanical Joint Wedge-action Restraining Gland, Epoxy Coated Restrain PVC pipe to mechanical joint fittings, and appurtenances.**						
		EBAA Iron Inc	Mega-lug Series 2000PV		Mega-lug Series 2000PV		Mega-lug Series 2000PV	
			NA	NA	NA	NA	Megalug Series 2200	(42"-48")
		Ford / Uni-Flange	UFR 1500 Series		UFR 1500 Series		UFR 1500 Series	
		Sigma	One Lok Series SLC/SLCE		One Lok Series SLC/SLCE		One Lok Series SLC/SLCE	
		Smith Blair	Cam Lok Series 120		Cam Lok Series 120		Cam Lok Series 120	
		Star	Star Grip Series 4000		Star Grip Series 4000		Star Grip Series 4000	
		Tyler Union	TufGrip Series TLP		TufGrip Series TLP		TufGrip Series TLP	
	PVC Bell Joint Restraints (4" - 12") (New & Existing)	**PVC Bell Joint Restraints: PVC pipe Split Serrated on Bell End and Spigot End. (4" - 12") (New & Existing)**						
		EBAA Iron Inc	Tru-Dual Series 1500TD		Tru-Dual Series 1500TD		Tru-Dual Series 1500TD	
		Ford / Uni-Flange	Uni-Flange Series 1390		Uni-Flange Series 1390		Uni-Flange Series 1390	
		Sigma	PV-Lok Series PWP		PV-Lok Series PWP		PV-Lok Series PWP	
		Smith Blair	Bell-Lock Series 165		Bell-Lock Series 165		Bell-Lock Series 165	
		Star	Series 1100C		Series 1100C		Series 1100C	
		Tyler Union	TufGrip 300C		TufGrip 300C		TufGrip 300C	

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Joint Restraints	PVC Bell Joint Restraints (16" & Greater)	**PVC Bell Joint Restraints: (16" & Greater) PVC pipe Split Serrated on Bell End and Spigot End. Water & Reclaimed Water Existing pipe only. Wastewater shall be new and existing pipe.**						
		Ford / Uni-Flange	Series 1390	Existing Only	Series 1390	Existing Only	Series 1390	
		JCM	Sur-Grip Series 621	Existing Only	Sur-Grip Series 621	Existing Only	Sur-Grip Series 621	
		Sigma	PV-Lok PWP	Existing Only	PV-Lok PWP	Existing Only	PV-Lok PWP	
		Smith Blair	Bell-Lock Series 165	Existing Only	Bell-Lock Series 165	Existing Only	Bell-Lock Series 165	
		Star	Series 1100C	Existing Only	Series 1100C	Existing Only	Series 1100C	
Pipe	PVC C900 DR 18 Bell & Spigot (4" - 12")	**C900 Bell & Spigot PVC Pipe: 4 to 12-inch - AWWA C-900, Minimum DR18 for Water, Reclaimed and Wastewater. DR14 for Fire Lines. Manufacturers shall be members in good standing with Uni-Bell to maintain approval status.**						
		Certainteed 4" to 12"	Certa-Lok C900/RJ	Blue	Certa-Lok C900/RJ	Pantone Purple	Certa-Lok C900/RJ	Green
		Diamond Plastics Corp	C-900	Blue	C-900	Pantone Purple	Diamond C900	Green
		Ipex Inc	C-900 Blue Brute	Blue	C-900	Pantone Purple	C900 Blue Brute	Green
		JM Eagle	C-900	Blue	C-900	Pantone Purple	C-900	Green
		National Pipe & Plastics Inc	C-900 Dura- Blue	Blue	C-900	Pantone Purple	C-900 Pipe	Green
		North American Pipe Corp (NAPCO)	C-900	Blue	C-900	Pantone Purple	C-900	Green
		Sanderson Pipe Corp	C-900	Blue	C-900	Pantone Purple	C-900	Green
	PVC C905 DR 18 Bell & Spigot 16" and Larger	**C905 Bell & Spigot PVC Pipe 16" and Larger: AWWA C-905, Minimum DR18 for all Force Mains up to 24". Minimum DR21/DR25 for 30" and greater. Manufacturers shall be members in good standing with Uni-Bell to maintain approval status.**						
		Certainteed 16"	NA	NA	NA	NA	Certa-Lok C905/RJ	NA
		Diamond Plastics Corp	NA	NA	NA	NA	Trans-21 DR18	Green
		Ipex Inc	NA	NA	NA	NA	IPEX Centurion	Green
		JM Eagle	NA	NA	NA	NA	C905 Big Blue	Green
		National Pipe & Plastics Inc	NA	NA	NA	NA	C905	Green
		North American Pipe Corp (NAPCO)	NA	NA	NA	NA	C905 Big Blue	Green
	HDPE C906 DR11	**HDPE Pipe DR11 AWWA C906 shall be Ductile Iron Pipe Size, PE 3408/3608/4710 DIPS manufactured in accordance with ASTM F-714 and listed with NSF. Pipe shall be marked in accordance with either AWWA C901,AWWA C906. Compression type connections are not acceptable in new installations. Pipe joints shall be butt fusion or electro-fusion with flange or adapter. All HDPE shall be color coded to the Utility. Color identifications are in accordance with the APWA/ULCC Uniform Color Code. Manufacturers shall be members in good standing with PPI to maintain approval status.**						
		JM Eagle	HDPE	DR11 Blue	HDPE	DR11 Pantone	HDPE	DR11Green
		Performance Pipe(Chevron)	Driscoplex 4000	DR11 Blue	Driscoplex 4000	DR11 Pantone	Driscoplex 4300	DR11 Green
		PolyPipe, Inc.	EHMW Poly Pipe	DR11 Blue	EHMW	DR11 Pantone	EHMW	DR11Green

APPENDIX D **LIST OF APPROVED PRODUCTS - TRANSMISSION SYSTEMS** **FEBRUARY 11, 2011**

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Pipe	Ductile Iron Pipe	**Ductile iron/Cast iron: (4" to 12" = Class 350, 16" to 24" - Class 250, 30" to 64" = Class 200). Water and Reclaimed water shall be cement lined. Wastewater Piping shall be Protecto 401 and Holiday Free. Exterior coatings as specified. Wastewater DIP piping shall be for pump station piping only. Manufacturers shall be members in good standing with DIPRA to maintain approval status.**						
		American	Cement Lined	Blue	Cement Lined	Pantone Purple	Protecto 401	Pump Station
		Griffin	Cement Lined	Blue	Cement Lined	Pantone Purple	Protecto 401	Pump Station
		McWane Inc. DI Pipe Group	Cement Lined	Blue	Cement Lined	Pantone Purple	Protecto 401	Pump Station
		US Pipe	Cement Lined	Blue	Cement Lined	Pantone Purple	Protecto 401	Pump Station
Sample	Sample Station	**Sample Stations - Bacteriological Sample Station with built in flush system, all internal piping to be 2", brass and includes lockable green enclosures.**						
		Safety-Guard	SG-BSS-05 pedestal #77	green enclosure	NA	NA	NA	NA
		Water Plus Corp	Model 5000	green	NA	NA	NA	NA
Services	Brass Service Saddles	**Brass Service Saddles for 1" & 2" water & reclaimed water services on 4" through 12" Mains - Service saddles can be hinge or bolt controlled OD saddles to be used on C-900 and existing IPS OD PVC pipe.**						
		Ford	Series S-70, S-90	4"-12"	Series S-70, S-90	4"-12"	NA	NA
		AY McDonald	Model 3891 / 3895,3801 / 3805	4"-12"	Model 3891 / 3895,3801 / 3805	4"-12"	NA	NA
		Mueller	Series S-13000/H-13000	4"-12"	Series S-13000/H-13000	4"-12"	NA	NA
	Service Saddles	**Service Saddles for 1" (CC) & 2" (Iron pipe threads) Water & Reclaimed Water services on mains greater than 12". Service saddles for 2" taps (iron pipe threads) on 4" mains and greater for Waste Water. : Epoxy or nylon coated stainless steel 18-8-type 304 double straps, controlled O.D. saddles to be used on C-900 / C905 or DI for all 1-in and -2in taps on pipes over 12in.**						
		Ford	Series FC202	16" & greater	Series FC202	16" & greater	Series FC202	4" & greater
		JCM	Series 406	16" & greater	Series 406	16" & greater	Series 406	4" & greater
		Mueller	DR2S	16" & greater	DR2S	16" & greater	DR2S	4" & greater
		Romac	Series 202NS	16" & greater	Series 202NS	16" & greater	Series 202NS	4" & greater
		Smith Blair	Series 317	16" & greater	Series 317	16" & greater	Series 317	4" & greater
	Service Saddles for HDPE	**Service Saddles for 1" (CC) & 2" (Iron Pipe threads) Water and Reclaimed Water Services: Epoxy or nylon coated stainless steel 18-8-type 304 double straps, controlled O.D. saddles to be used on HDPE for all 1-in and -2in taps. Taps to HDPE pipe shall be approved on a case by case basis.**						
		Ford	Series FCP202		Series FCP202		Series FCP202	
		Romac	Series 202N-H		Series 202N-H		Series 202N-H	
		Smith Blair	Series 317-1 for HDPE		Series 317-1 for HDPE		Series 317-1 for HDPE	
	Corporation Stops Ball Type	**Corporation Stops Ball Type (1-inch with AWWA taper C threads only/pack joint outlet for CTS) 2" Corporation Stop Ball Type shall be 2" MIP X FIP threads.**						
		Ford	FB1000, FB1700-7		FB1000, FB1700-7		FB1700-7	2" ARV
		AY McDonald	4701B-22, 3149B2		4701B-22, 3149B2		3149B2	2" ARV
		Mueller	P25008, B-20046		P25008, B-20046		B-20046	2" ARV

APPENDIX D **LIST OF APPROVED PRODUCTS - TRANSMISSION SYSTEMS** **FEBRUARY 11, 2011**

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Services	Curb Stops	**Curb Stops - Straight Valves: Ball type compression 2" cts O.D. tubing by 2" FIP**						
		Ford	B41-777W		B41-777W		NA	NA
		AY McDonald	6102W-22		6102W-22		NA	NA
		Mueller	P25172		P25172		NA	NA
	Curb Stops	**Curb Stops - Straight Valves: ball type compression x compression**						
		Ford	B44-444W		B44-444W		NA	NA
		AY McDonald	6100W-22		6100W-22		NA	NA
		Mueller	P25146		P25146		NA	NA
	PE tubing	**Polyethylene tubing: AWWA C901. UV protection (SDR-9) 1-inch and 2-inch only. PE 3408 / PE 4710**						
		Charter Plastics	Blue Ice		Lav Ice		NA	NA
		Endot	Endopure Blue		Endocore Lavender		NA	NA
		JM Eagle	Pure-Core		NA	NA	NA	NA
Tapping Sleeves and Valves	Line Stops	**Line Stops**						
		JCM						
		Romac						
		Smith Blair						
	Tapping Sleeves	**Tapping Sleeves: (Mechanical joint for taps on cast iron, ductile iron, PVC & AC pipe, including size on size) with stainless steel nuts and bolts.**						
		American Flow Control	Series 2800		Series 2800		Series 2800	
			Series 1004		Series 1004		Series 1004	
		Clow	Series F-5205	DIP/PVC	Series F-5205	DIP/PVC	Series F-5205	DIP/PVC
			Series F-5207	A/C Pipe	Series F-5207	A/C Pipe	Series F-5207	A/C Pipe
		JCM	Series 414	FBE	Series 414	FBE	Series 414	FBE
		Mueller	Series H-615	DIP/PVC	Series H-615	DIP/PVC	Series H-615	DIP/PVC
			Series H-619	A/C Pipe	Series H-619	A/C Pipe	Series H-619	A/C Pipe
		Smith Blair	Style 623	FBE	Style 623	FBE	Style 623	FBE
	Tapping Valves: 12" and smaller	**Tapping Valves: 12" and smaller - Tapping Valves shall be furnished with an alignment lip and installed in the vertical position for Water and Reclaim Water. Wastewater shall be installed horizontally and abandoned in the open position. Tapping valves shall be resilient seated only and meet the requirements of AWWA C509 or C515**						
		American Flow Control	Series 2500	Alignment Lip	Series 2500	Alignment Lip	Series 2500	Alignment Lip
		Clow	Series F-6114	Alignment Lip	Series F-6114	Alignment Lip	Series F-6114	Alignment Lip
		Mueller	Series T2360 (4"-12")	Alignment Lip	Series T2360 (4"-12")	Alignment Lip	Series T2360 (4"-12")	Alignment Lip

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Tapping Sleeves and Valves	Tapping Valves: 16" and Larger	**Tapping Valves: 16" and Larger - Tapping valves shall be furnished with an alignment lip and be installed in the vertical position for Water and Reclaimed Water. No tapping valve shall be installed horizontally for Water and Reclaim Water unless approved by the engineer. Tapping Valves 16" and larger AWWA C515 resilient seated only (16" and 24" no gearing required) above 24" shall be installed vertically with a spur gear actuator unless noted by the engineer. All tapping valves above 24" shall be furnished with NPT pipe plugs for flushing the tracks when valves are installed horizontally. Tapping valves for Wastewater shall be installed horizontally and abandoned in open position.**						
		American Flow Control	Series 2500	Alignment Lip & flushing port	Series 2500	Alignment Lip & flushing port	Series 2500	Alignment Lip & flushing port
		Clow	Series F-6114	Alignment Lip & flushing port	Series F-6114	Alignment Lip & flushing port	Series F-6114	Alignment Lip & flushing port
		Mueller	Series T2361 (14"&up)	Alignment Lip & flushing port	Series T2361 (14"&up)	Alignment Lip & flushing port	Series T2361 (14"&up)	Alignment Lip & flushing port
Valves	Butterfly Valve 42" and Above	**Butterfly Valves 42"and above. AWWA C504. Actuators input torques based on 150 psi valve pressure and 16 fps velocity with a maximum input of 80 ft-lb on 2" nuts and shall withstand 250 ft-lbs. Valve seats shall be leak-tight in both directions at 150 psi.**						
		Clow	Style #1450		Style #1450		NA	NA
		Dezurik	BAW		BAW		NA	NA
		Mueller / Pratt	LINSEAL III / Groundhog		LINSEAL III / Groundhog		NA	NA
	Check Valves	**Valves (Check) 4-inch and Larger (8 mil epoxy lined)**						
		American Flow Control	NA		NA		Series 600 or 50 line	
		Clow / M&H / Kennedy	NA		NA		106	
		Mueller	NA		NA		Series 2600	
	Gate Valves 4" - 12"	**Gate Valves 12" and smaller - resilient seated only AWWA C509 or C515. Valve seat shall be leak-tight in both directions at 150 psi.**						
		American Flow Control	Series 2500		Series 2500		NA	NA
		Clow	Series F-6100		Series F-6100		NA	NA
		Mueller	Series A-2360		Series A-2360		NA	NA
	Gate Valves (Vertical) 16" and Up	**Gate Valves 16" and larger (Vertical Installation) AWWA C515 resilient seated only (16" and 24" no gearing required) above 24" shall be installed vertically with a gear actuator unless noted by the engineer. Valve seat shall be leak-tight in both directions at 150 psi.**						
		American Flow Control	Series 2500		Series 2500		NA	NA
		Clow	Series F-6100		Series F-6100			
		Mueller	Series A-2361		Series A-2361		NA	NA

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Valves	Plug Valves	**Plug Valves - Bi-directional, MJ & Flanged (min. 8mil fusion bonded epoxy with stainless steel bolts), gear operator to be sized for rated pressure of the valve. Valves 4"-20" shall be 80% Full Port and valves 24" and greater shall be minimum of 70% full port. Valve shall be factory tested to minimium 100 PSI in both directions.**						
		Clow	NA	NA	NA	NA	F-5412 FLG	4" & up
			NA	NA	NA	NA	F-5413 MJ	4" & up
		Dezurik	NA	NA	NA	NA	Series PEF or PEC	4"& up
		Millikan / Pratt	NA	NA	NA	NA	Eccentric / Ballcentric	4"& up
		Val-Matic	NA	NA	NA	NA	5600 or 5800 (FLG)	4" & up
			NA	NA	NA	NA	5700 or 5900 (MJ)	4" & up
Valve Boxes	Valve Boxes with Locking Lids (Cast Iron)	**Two piece standard screw type Heavy Duty Valve Boxes with Locking Lids (Cast Iron) and type of service cast in heavy duty traffic lid (H20 loading) ASTM A48**						
		Bingham/Taylor	Series 4905	Box	NA	NA	Series 4905	Box
			4905-X	Extension	NA	NA	4905-X	Extension
			4904-L	Blue Water Locking Lid	NA	NA	4904-L	Green Sewer locking Lid
		Sigma	Series VB 261X-267X	Box	VB-25031LK-VB-2612	Box	Series VB 261X-267X	Box
			VB 6302	Extension	VB-6302	Extension	VB 6302	Extension
			VB 4650W	Blue Water Locking Lid	VB2503LK	Purple Square Locking Lid	VB 4650S	Green Sewer locking Lid
		Star	Series VB-0002	Box	NA	NA	Series VB-0002	Box
			VBEX 12-24S	Extension	NA	NA	VBEX 12-24S	Extension
			VBLIDLOCK	Blue Water Locking Lid	NA	NA	VBLIDLOCK	Green Sewer locking Lid
		Tyler Union	Series 6850	Box	NA	NA	Series 6850	Box
			58, 59, 60	Extension	NA	NA	58, 59, 60	Extension
			Locking Lid	Blue Water Locking Lid	NA	NA	Locking Lid	Green Sewer locking Lid
	Valve Box	**For mains equal to, or greater than, 16" diameter or equal to greater than 6' feet deep**						
		American Flow Control	# 2A - 9A Retrofit Valve Box Insert	Fit inside std valve boxes	NA		2A - 9A Retrofit Valve Box Insert	Green Sewer locking Lid
		Mueller Company	MVB050C thru MVB130C with Extension Stem MVB875 Guide Plate	Blue Water Locking Lid	MVB050CR thru MVB130CR with Extension Stem MVB875 Guide Plate	Purple Square Locking Reclaim Lid	MVB050C thru MVB130C with Extension Stem MVB875 Guide Plate	Green Sewer locking Lid

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Coatings	Anti-Graffiti Paint	**Block Walls-Anti-Graffiti Paint per Section 3119 Coatings & Linings**						
		American Building Restoration Products	NA	NA	NA	NA	Polyshield Graffiti Preventer for Unpainted Masonry Type B	Super Bio Strip or Strip it all
		Tnemec / Chemprobe	NA	NA	NA	NA	626 DUR A PEL	680 Mark A Way
		Professional Products of Kansas, Inc	NA	NA	NA	NA	Professional Water Seal & Anti-Graffitiant (PWS-15 Super Strength)	Professional Phase II Cleaner
	Coatings for Existing Manholes	**Rehabilitation corrosion protection system per Section 3119 Coatings & Linings. Interior coating for force main connections to existing concrete manholes only. New precast structures and existing pump stations shall be lined.**						
		CCI Spectrum, Inc	NA	NA	NA	NA	Spectrashield	min of 500 mils
		Kerneos Aluminate Technologies	NA	NA	NA	NA	Sewpercoat	1" (1000mil)
		Raven Lining System	NA	NA	NA	NA	Raven 155 Primer Raven 405	min 8 mils min 125 mils
		Sauereisen	NA	NA	NA	NA	210 Series Topcoat Glaze 210G	min 125 mils min 20 mils
		Tnemec	NA	NA	NA	NA	Series 434 Topcoat Glaze 435	min 125 mils 15-20 mils
PVC Pipe and fittings	Pipe SDR 35 Gravity Mains	**PVC Pipe for Gravity SDR26/SDR 35 (Green in color) ASTM-D034. Manufacturers shall be members in good standing with Uni-Bell to maintain approval status.**						
		Certainteed	NA	NA	NA	NA	Gravity Sewer Pipe	
		Diamond Plastics Corp	NA	NA	NA	NA	Sani-21 SDR-35	
		JM Eagle	NA	NA	NA	NA	Gravity Sewer	
		National Pipe & Plastics, Inc.	NA	NA	NA	NA	Ever-Green Sewer Pipe	
		North American Pipe Corp (NAPCO)	NA	NA	NA	NA	Gravity Sewer	
		Sanderson Pipe Corp	NA	NA	NA	NA	Gravity Sewer	
	Locate Balls	**Locating Marker Systems - Wastewater Locator balls placed at all sanitary sewer cleanouts**						
		3M	NA	NA	NA	NA	3M™ EMS 4" Extended Range 5' Ball Marker 1404-XR	
	Fittings SDR 35	**Fittings, Adapters and Plugs - Gravity PVC ASTM-D3034, Min SDR26/ SDR 35**						
		GPK Products, Inc.	NA	NA	NA	NA	SDR26/SDR35 Gasketed sewer fittings	
		Harrington Corporation (HARCO)	NA	NA	NA	NA	SDR26/SDR35 Gasketed sewer fittings	
		Multi Fittings Corp.	NA	NA	NA	NA	SDR26/SDR 35 Trench Tough Sewer Fittings	
		JM Eagle	NA	NA	NA	NA	SDR26/SDR35 Gasketed sewer fittings	
		Plastic Trends Inc	NA	NA	NA	NA	SDR26/SDR35 Gasketed sewer fittings	
		TIGRE USA, Inc.	NA	NA	NA	NA	SDR26/SDR35 Gasketed sewer fittings	

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
PVC Pipe a	Flexible Pipe Connectors	**Flexible Pipe Connectors and Transitions**						
		Fernco	NA	NA	NA	NA	1002, 1051, 1056 Series	
		Indiana Seal	NA	NA	NA	NA	102, 151, 156 Series	
		Mission Rubber	NA	NA	NA	NA	MR02, MR51, MR 56 Series	
Precast Concrete Structures	MH Lids	**Frame and Cover**						
		USF Fabrication Inc.	NA	NA	NA	NA	USF 225-AS	
	Adj Ring	**Top Adjusting Rings - HDPE with heavy duty loading (H-20)**						
		Ladtech, Inc	NA	NA	NA	NA	24R, 24S with Rope Sealant CS2455	
	Hatches	**Wet Well and Valve Vault Access Frames and Covers (Include the term "Confined Space" etched or cast into the cover with recessed lock & hasp. Frames and covers per manufacturers specifications.**						
		Halliday Products	NA	NA	NA	NA	S1R or S2R Series	
		USF Fabrication Inc.	NA	NA	NA	NA	APS or APD Series	
	Precast Concrete Structures	**Precast Manhole and Wetwell Structures ASTM C478. Precast concrete shall be batched with concrete dyed crystalline waterproofing admixture with corrosion protection. Concrete without admixture or without color tint /tracer shall be rejected.**						
		Allied Precast	NA	NA	NA	NA	Dyed Admix	
		Atlantic Concrete Products, Inc.	NA	NA	NA	NA	Dyed Admix	
		Delzotto Products, Inc.	NA	NA	NA	NA	Dyed Admix	
		Dura Stress Underground Inc.	NA	NA	NA	NA	Dyed Admix	
		Hanson Pipe & Product	NA	NA	NA	NA	Dyed Admix	
		Mack Concrete	NA	NA	NA	NA	Dyed Admix	
		Oldcastle Precast	NA	NA	NA	NA	Dyed Admix	
		Standard Precast Inc.	NA	NA	NA	NA	Dyed Admix	
	Concrete Admix	**Crystalline Waterproofing Concrete Admix with color dye shall be added to all concrete structures (precast and cast-in-place) to provide waterproofing and corrosion resistance. Concrete without admixture or without color tint / tracer shall be rejected. % concentration of admix with colored dye added to the mix shall be based on weight of cement.**						
		Kryton International	NA	NA	NA	NA	KIM K-301R (with red dye)	2%
		Xypex Chemical Corp	NA	NA	NA	NA	Xypex Admix C-1000Red (with red dye)	3.0 - 3.5%
	Liners	**Interior Liner for New or existing Precast Manhole and Precast Wetwell Structures per Section 3119 Coatings & Linings**						
		AFE	NA	NA	NA	NA	Fiberglass Liner	
		AGRU Liner	NA	NA	NA	NA	HDPE Liner (Min 2 mm for Manhole / Min 5 mm for Pump Station)	
		Containment Solutions Inc. (Flowtite)	NA	NA	NA	NA	Fiberglass Liner	
		GSE Studliner	NA	NA	NA	NA	HDPE Liner (Min 2 mm for Manhole / Min 5 mm for Pump Station)	
		GU Liner	NA	NA	NA	NA	Reinforced Plastic Liner	
		L & F Manufacturing	NA	NA	NA	NA	Fiberglass Liner	

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Precast Concrete Structures	Heat Shrink Seal	**Heat Shrink Seal - Precast structures shall be primed with manufacturer approved primer prior to application of heat shrunk encapsulation.**						
		Canusa-CPS	NA	NA	NA	NA	Wrapid Seal with WrapidSeal Primer (Canusa G Primer)	
		Pipeline Seal & Insulator, Inc (PSI)	NA	NA	NA	NA	Riser Wrap with Polyken 1027 or 1039 primer	
	Jointing Material	**Jointing Material Min. 2" width for all products to ensure squeeze out with manufacturer approved primer.**						
		Henry Company	NA	NA	NA	NA	Ram-Nek	with Primer
		Martin Asphalt Company	NA	NA	NA	NA	Evergrip 990	with Primer
		Trelleborg Pipe Seals	NA	NA	NA	NA	NPC – Bidco C-56	with Primer
	Pipe Seals Gravity	**Resilient Connector Pipe Seals, Manhole - Gravity less than 12-inch and less than 15-ft deep**						
		Atlantic Concrete	NA	NA	NA	NA	A-Lok (cast-in-place)	
		Hail Mary Rubber	NA	NA	NA	NA	Star Seal (cast-in-place)	
		IPS	NA	NA	NA	NA	Wedge Style	
		NPC	NA	NA	NA	NA	Kor-N-Seal Model WS	
		Press seal gasket	NA	NA	NA	NA	PSX Direct Drive	
	Pipe Seals Gravity	**Cast in Place Pipe Seals, Manhole - Gravity Greater Than or Equal to 12-inch and all pipe sizes greater than 15-ft deep**						
		Atlantic Concrete	NA	NA	NA	NA	A-Lok	cast in place
		Hail Mary Rubber	NA	NA	NA	NA	Star Seal	cast in place
	FM Pipe Seals	**Modular Pipe Seals for Wet Well and Valve Box penetrations and all forcemain connections to existing and new precast concrete structures. EPDM Rubber with 316 SS Hardware**						
		CCI Pipeline Systems	NA	NA	NA	NA	Wrap-It Link WL-SS Series	
		Pipeline Seal & Insulator, Inc / Link Seal	NA	NA	NA	NA	Link-Seal S-316 Modular Seal	
		Proco Products, Inc	NA	NA	NA	NA	PenSeal ES-PS Series	

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Generator	Gen	**Generator Systems, Fixed Shall be UL 2200 Certified.**						
		Caterpillar	NA	NA	NA	NA	CAT Diesel Generator Set	
		Cummins Power Generation	NA	NA	NA	NA	Diesel Generator Set	
	Fuel Tanks	**Generator Fuel Tanks. Shall be UL2085 certified.**						
		Convault	NA	NA	NA	NA	CVT-3SF or CVT-3FF	
		Phoenix	NA	NA	NA	NA	Envirovault	
	GR	**Generator Receptacle (GR)**						
		Cooper Crouse-Hinds	NA	NA	NA	NA	AR2042 (230V, 200A, 3P, 4W)	With AJA1 Angle Adaptor
		Cooper Crouse-Hinds	NA	NA	NA	NA	AR2042-S22 (460V, 200A, 3P, 4W)	With AJA1 Angle Adaptor
		Pyle National	NA	NA	NA	NA	JRE-4100 (230V, 100A, 3P, 4W)	
	ATS	**Generator Transfer Switch**						
		Russelectric	NA	NA	NA	NA	RMTD Series with model 2000 controller	NEMA 12/3R 316SS Enclosure
Odor Control Units	Biotrickling Filters	**Biotrickling filters**						
		BioAir	NA	NA	NA	NA		
		Biorem	NA	NA	NA	NA	Biosorbens BTF	
		Envirogen	NA	NA	NA	NA	BTF	
		Siemens	NA	NA	NA	NA	Zabocs BTF	
	Carbon Adsorption Units	**Carbon Adsorption Units**						
		Calgon	NA	NA	NA	NA		
		Pure Air Filtration	NA	NA	NA	NA		
		Siemens	NA	NA	NA	NA		
Pressure Gauges	Pressure Gauges	**Pressure Gauges shall have Diaphragm Seals. Oil filled.**						
		Ashcroft	NA	NA	NA	NA	10 1008SL 02L 60# 25 200SS 02T XYTSE	Gauge Diaphragm Seal
		Trerice	NA	NA	NA	NA	D83LFSS4002LA100 - Gauge M51001SSSS - Diaphragm Seal D99100 Fill and Mount Charge	
		Winter Gauges	NA	NA	NA	NA	PFQ770 0-60 PSI D70950 top D70954 Bottom	
Pumps	Pumps	**Submersible Pumps**						
		ABS	NA	NA	NA	NA		
		Flygt	NA	NA	NA	NA		

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Pumps	Floats	**Float Regulator (FR) - Duplex and Triplex Pump Stations**						
		Atlantic Scientific	NA	NA	NA	NA		Roto-Float
	Radar	**Radar - Pulse Burst Radar Transmitter. Input 24 VDC and Output 4-20 mA**						
		Magnetrol	NA	NA	NA	NA		R82-520A-011
Pump Station Main Ser	Main Srvc Disconne	**Main Service Disconnect Breaker**						
		Square D	NA	NA	NA	NA		H or J Frame 3 Pole 600 Volt (HGL or JGL determined by amperage)
	Surge Protector Device	**Surge Protector - UL 1449, 3rd Edition listed and labeled, minimum 10 year warranty, NEMA LS-1 and IEEEC62, 41/45 tested with NEMA 4X enclosure, internal fusing, voltage and phase to match service. Rated 80,000 amps per mode for Duplex & Triplex stations and 150,000 Amperes per mode for Master Stations. All devices shall be provided with a NEMA 4X Plastic enclosure which is approved in lieu of stainless steel.**						
		Current Technology (Power & Systems	NA	NA	NA	NA		XN-80, TG-150 or CurrentGuard 150 Plus Series
		Josyln AKA (Total Protection Solutions)	NA	NA	NA	NA		TSS-ST 160 Series, ST 300 Series or JSP-300 Series
		Surge Suppressors, Inc	NA	NA	NA	NA		LSE Series or SHL Series
Sub Panel	Sub Panel	**Sub-Panel Enclosure - NEMA 12/3R Enclosure 316SS, white polyester Powder coated finish inside and out, With 3 Point Pad lockable Handle, and Door Stop**						
		Hoffman	NA	NA	NA	NA		
		Schaefer	NA	NA	NA	NA		
		Universal enclosure systems	NA	NA	NA	NA		
Pump Station Control Panel	Control Panel	**Control Panel Supplier**						
		ECS	NA	NA	NA	NA		
		Sta-Con Inc	NA	NA	NA	NA		
	Enclosure	**Enclosure - NEMA 12/3R Enclosure 316SS, white polyester Powder coated finish inside and out, With 3 Point Pad lockable Handle, and Door Stop**						
		Hoffman	NA	NA	NA	NA		
		Schaefer	NA	NA	NA	NA		
		Universal enclosure systems	NA	NA	NA	NA		
	Mnts	**Mounting Channel for Enclosures**						
		Unistrut Stainless Steel	NA	NA	NA	NA		1" 5/8 x 1" 5/8 316 SS
	Seal-off	**Explosion-Proof Sealoff**						
		Cooper Crouse-Hinds	NA	NA	NA	NA		EYSR - 2 Inch Min.
	FL	**Flasher (FL)**						
		MPE	NA	NA	NA	NA		025-120-105
		SSAC	NA	NA	NA	NA		FS-126

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Pump Station Control Panel	AL	**Alarm Light / With Base and Globe (AL)**						
		American Electric	NA	NA	NA	NA	F32552	
		Red Dot Globe Red Dot Base	NA	NA	NA	NA	VGLR-01 VA-01	
	AH	**Alarm Horn (AH)**						
		Wheelock	NA	NA	NA	NA	3IT-115-R	
	Fuse	**Fuses (F)**						
		Bussmann	NA	NA	NA	NA	FNQ-R or KTK-R	
	HOA	**Hand-Auto-Off Selector (HOA)**						
		Square D	NA	NA	NA	NA	9001-SKS43B	
	HSS	**Horn Silence Button (HSS)**						
		Square D	NA	NA	NA	NA	9001-SKR1RH5	
	Inter-lock	**Mechanical Interlock**						
		Square D	NA	NA	NA	NA	S29354	
	Breakers	**Control Panel Main Circuit Breaker (MCB) With S29450 Circuit Breaker Auxiliary Switch**						
		Square D	NA	NA	NA	NA	H or J Frame 3 Pole 600 Volt (HGL or JGL determined by amperage)	
		Emergency Circuit Breaker (ECB) With S29450 Circuit Breaker Auxiliary Switch						
		Square D	NA	NA	NA	NA	H or J Frame 3 Pole 600 Volt (HGL or JGL determined by amperage)	
		Motor Circuit Breaker (MB)						
		Square D	NA	NA	NA	NA	H or J Frame 3 Pole 600 Volt (HGL or JGL determined by amperage)	
		Control Circuit Breaker/ GFCI Receptacle Breaker/ SCADA Breaker						
		Square D	NA	NA	NA	NA	QOU120	
	MS	**Motor Starter (MS)**						
		Square D	NA	NA	NA	NA	Type S Class 8536	
	OL	**Overload Heater(OL)**						
		Square D	NA	NA	NA	NA	Part number will vary with size needed	
	OR	**Overload Reset**						
		Square D	NA	NA	NA	NA	9066-RA1	
	Transformer	**Control Circuit Transformer (XMFR)**						
		Square D	NA	NA	NA	NA	9070TF75D23	120/24 Volt .075 KVA
		Main Circuit Transformer (MCT)						
		Square D	NA	NA	NA	NA	9070T2000D1	480/120 2KVA
	SPB	**Supplemental Protector Breaker - 3 pole, 1-amp for Phase Monitor**						
		Square D	NA	NA	NA	NA	MG24532	

APPENDIX D **LIST OF APPROVED PRODUCTS - PUMP STATION SYSTEMS** **FEBRUARY 11, 2011**

Cat.	Desc	Manufacturer	Water		Reclaimed Water		Wastewater	
			Model #	Comments	Model #	Comments	Model #	Comments
Pump Station Control Panel	PM	**Phase Monitor (PM)**						
		MPE 240 V.	NA	NA	NA	NA	001-230-118-OVG5	
		MPE 480 V.	NA	NA	NA	NA	002-480-123-OVG5	
	Pump Alternator	**Pump Automatic Alternator (PAA)**						
		Diversified Duplex	NA	NA	NA	NA	ARA-120-ACA	
		Diversified Triplex	NA	NA	NA	NA	ARA-120-AME	
		MPE Duplex	NA	NA	NA	NA	008-120-13SP	
		MPE Triplex	NA	NA	NA	NA	009-120-23P	
		MPE Triplex Socket	NA	NA	NA	NA	SD-12-PC	
	Alt. Test Switch	**Alt. Test Switch**						
		Carling Technologies	NA	NA	NA	NA	6GG5E-78	
		Honeywell	NA	NA	NA	NA	2TL1-50	
	Relay	**Relay**						
		Potter Brumfield 24 Volt	NA	NA	NA	NA	KRPA-11AN-24	
		Potter Brumfield 120 Volt	NA	NA	NA	NA	KRPA-11AN-120	
		Square D 24 Volt	NA	NA	NA	NA	8501KP12P14V14	
		Square D 120Volt	NA	NA	NA	NA	8501KP12P14V20	
	Relay Base	**Relay Base**						
		IEDC 8 Pin Relay Base 600 Volt	NA	NA	NA	NA	SR2P-06	
	Duplex Receptacle / GFCI	**Duplex Receptacle/GFCI (DR) Upgraded to 20 Amp**						
		Hubbell	NA	NA	NA	NA	GFTR20BK	
		Pass & Seymour	NA	NA	NA	NA	2095TRBK	
	ETM	**Elapse Time Meter (ETM)**						
		Reddington	NA	NA	NA	NA	711-0160	
	Grounding	**Grounding System**						
		Marathon	NA	NA	NA	NA	Neutral Isolation Block 1421570	
		Panduit	NA	NA	NA	NA	Ground Lug LAM2A 1/0 - 014 -6Y	
		Square D	NA	NA	NA	NA	Ground Buss PK7GTA	
	TS	**Terminal Strip (TS)**						
		Marathon	NA	NA	NA	NA	Series 200	
		Square D	NA	NA	NA	NA	9080GR6	
	TS	**Terminal Strip End Blocks and End Clamps**						
		Square D	NA	NA	NA	NA	9080GM6B & 9080GH10	

APPENDIX D **LIST OF APPROVED PRODUCTS - PUMP STATION SYSTEMS** **FEBRUARY 11, 2011**

Cat.	Desc	Manufacturer	Water Model #	Water Comments	Reclaimed Water Model #	Reclaimed Water Comments	Wastewater Model #	Wastewater Comments
Pump Station Control Panel	PL	**Pilot Light (PL) 24 Volt with 1819 Bulb**						
		Dialight	NA	NA	NA	NA	803-1710	
		Lighting Components & Design	NA	NA	NA	NA	Littlelight 930507X	
	RL	**Run Indicator Light (RL) 120 Volt**						
		Dialight	NA	NA	NA	NA	803-1710	
		Lighting Components & Design	NA	NA	NA	NA	Littlelites 930507X With 120MB Bulb	
	MT	**Moisture and Temperature Failure Light (MT) 120 Volt with 120MB Bulb**						
		Dialight	NA	NA	NA	NA	803-1710	
		Lighting Components & Design	NA	NA	NA	NA	Littlelites 930507X	
Sluice	Sluice Gate	**Sluice Gate for Wet Well with Motorized Operator**						
		BNW	NA	NA	NA	NA	Model 77 - 316 SS	
		Fontaine	NA	NA	NA	NA	Model 20 - 316 SS	
VFD	VFD	**Variable Frequency Drives**						
		Square D	NA	NA	NA	NA		

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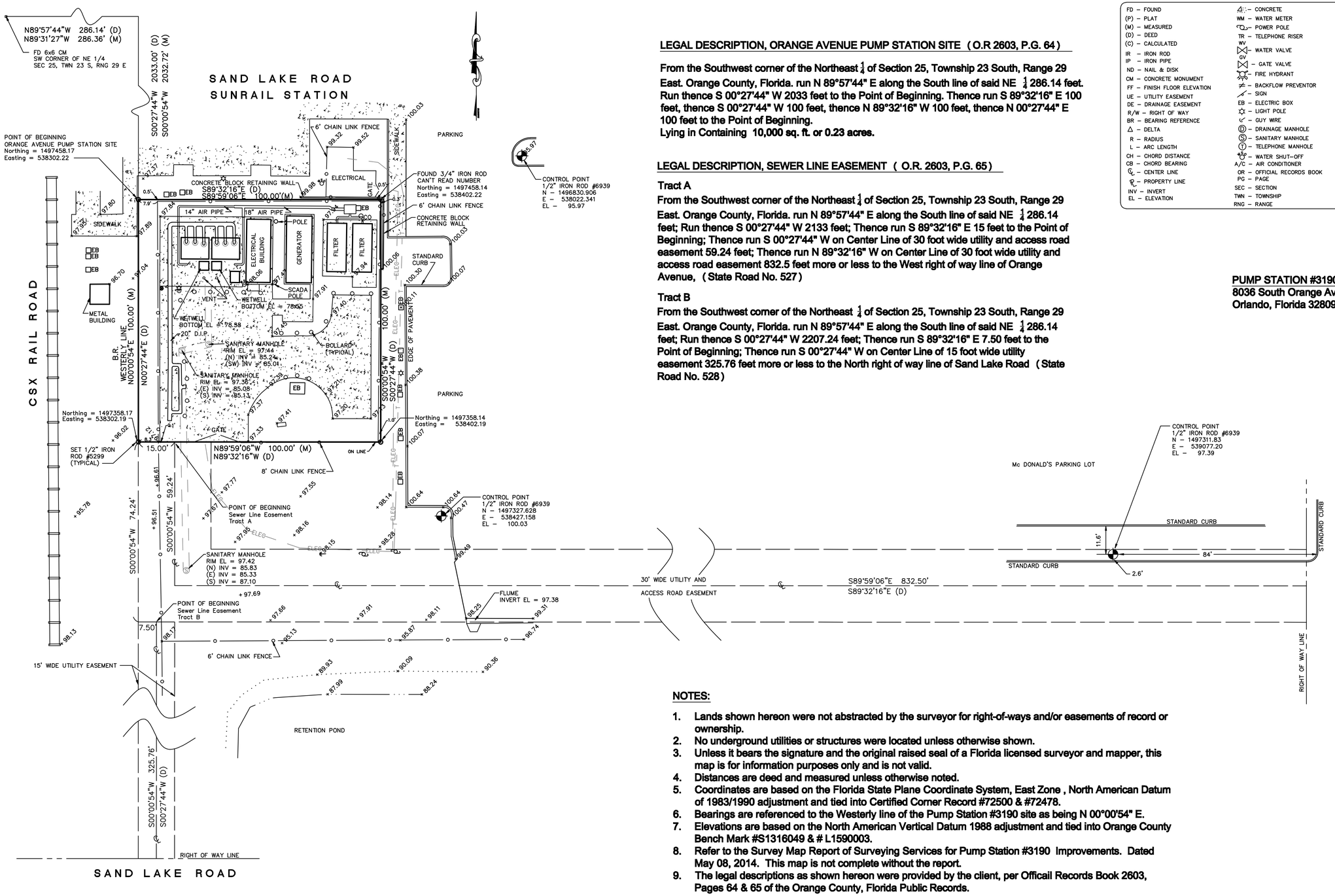
Appendix E
Boundary Survey(s)



LEGEND

FD – FOUND	⊿ – CONCRETE	T – BURIED TELEPHONE
(P) – PLAT	WM – WATER METER	G – BURIED GAS
(M) – MEASURED	– POWER POLE	FOC – BURIED FIBER OPTIC CABLE
(D) – DEED	TR – TELEPHONE RISER	ELEC – BURIED ELECTRIC
(C) – CALCULATED	WV – WATER VALVE	ohe – OVERHEAD ELECTRIC
IR – IRON ROD	GV – GATE VALVE	PVC – POLYVINYL CHLORIDE
IP – IRON PIPE	– FIRE HYDRANT	DIP – DUCTILE IRON PIPE
ND – NAIL & DISK	– BACKFLOW PREVENTOR	FM – FORCE MAIN
CM – CONCRETE MONUMENT	– SIGN	W – WATER MAIN
FF – FINISH FLOOR ELEVATION	EB – ELECTRIC BOX	RE – REUSE MAIN
UE – UTILITY EASEMENT	– LIGHT POLE	VCP – VETRIFIED CLAY PIPE
DE – DRAINAGE EASEMENT	– GUY WIRE	RCP – REINFORCED CONCRETE PIPE
R/W – RIGHT OF WAY	(D) – DRAINAGE MANHOLE	– PINE TREE W/SIZE XX
BR – BEARING REFERENCE	(S) – SANITARY MANHOLE	– OAK TREE W/SIZE XX
Δ – DELTA	(T) – TELEPHONE MANHOLE	– TREE W/SIZE XX
R – RADIUS	– WATER SHUT-OFF	– PALM TREE W/SIZE XX
L – ARC LENGTH	A/C – AIR CONDITIONER	
CH – CHORD DISTANCE	OR – OFFICIAL RECORDS BOOK	
CB – CHORD BEARING	PG – PAGE	
– CENTER LINE	SEC – SECTION	
– PROPERTY LINE	TWN – TOWNSHIP	
INV – INVERT	RNG – RANGE	
EL – ELEVATION		

LEGAL DESCRIPTION, ORANGE AVENUE PUMP STATION SITE (O.R 2603, P.G. 64)

From the Southwest corner of the Northeast ¼ of Section 25, Township 23 South, Range 29 East. Orange County, Florida. run N 89°57'44" E along the South line of said NE ¼ 286.14 feet. Run thence S 00°27'44" W 2033 feet to the Point of Beginning. Thence run S 89°32'16" E 100 feet, thence S 00°27'44" W 100 feet, thence N 89°32'16" W 100 feet, thence N 00°27'44" E 100 feet to the Point of Beginning.
Lying in Containing 10,000 sq. ft. or 0.23 acres.

LEGAL DESCRIPTION, SEWER LINE EASEMENT (O.R. 2603, P.G. 65)

Tract A

From the Southwest corner of the Northeast ¼ of Section 25, Township 23 South, Range 29 East. Orange County, Florida. run N 89°57'44" E along the South line of said NE ¼ 286.14 feet; Run thence S 00°27'44" W 2133 feet; Thence run S 89°32'16" E 15 feet to the Point of Beginning; Thence run S 00°27'44" W on Center Line of 30 foot wide utility and access road easement 59.24 feet; Thence run N 89°32'16" W on Center Line of 30 foot wide utility and access road easement 832.5 feet more or less to the West right of way line of Orange Avenue, (State Road No. 527)

Tract B

From the Southwest corner of the Northeast ¼ of Section 25, Township 23 South, Range 29 East. Orange County, Florida. run N 89°57'44" E along the South line of said NE ¼ 286.14 feet; Run thence S 00°27'44" W 2207.24 feet; Thence run S 89°32'16" E 7.50 feet to the Point of Beginning; Thence run S 00°27'44" W on Center Line of 15 foot wide utility easement 325.76 feet more or less to the North right of way line of Sand Lake Road (State Road No. 528)

PUMP STATION #3190
8036 South Orange Avenue
Orlando, Florida 32809

NOTES:

1. **Lands shown hereon were not abstracted by the surveyor for right-of-ways and/or easements of record or ownership.**
2. **No underground utilities or structures were located unless otherwise shown.**
3. **Unless it bears the signature and the original raised seal of a Florida licensed surveyor and mapper, this map is for information purposes only and is not valid.**
4. **Distances are deed and measured unless otherwise noted.**
5. **Coordinates are based on the Florida State Plane Coordinate System, East Zone , North American Datum of 1983/1990 adjustment and tied into Certified Corner Record #72500 & #72478.**
6. **Bearings are referenced to the Westerly line of the Pump Station #3190 site as being N 00°00'54" E.**
7. **Elevations are based on the North American Vertical Datum 1988 adjustment and tied into Orange County Bench Mark #S1316049 & # L1590003.**
8. **Refer to the Survey Map Report of Surveying Services for Pump Station #3190 Improvements. Dated May 08, 2014. This map is not complete without the report.**
9. **The legal descriptions as shown hereon were provided by the client, per Officail Records Book 2603, Pages 64 & 65 of the Orange County, Florida Public Records.**

PO BOX 568891, Orlando, Florida 32856-8891
phone (407) 306-0904 fax (407) 277-5492
LB# 6939
civil and environmental engineering consultants
Certified WBE

I hereby certify this survey to be true and correct to the best of my knowledge and belief as prepared under my direction. I also certify this survey meets the minimum technical standards of Florida Administrative Code Rule 5J-17, adopted by the Florida Board of Professional Surveyors & Mappers.

Russell A Brach, PSM #5299
Florida Land Business #6939

DRAWN DATE	05/08/14	FIELD DATE	04/30/14
DRAWN BY	RAB	SCALE	1" = 20'
CHECKED BY	RAB		
FILE NAME	PS3190Topo		

Pump Station # 3190

Orange County, Florida

Topographic / Boundary Survey

PROJECT NO. RE–07

1 of 1

Survey Map Report

Surveying Services for Pump Station #3190 Improvements (8036 South Orange Avenue)

PROJECT SCOPE AND LOCATION

From May 13, 2014 thru April 30, 2014 APEX Engineering, Inc. performed a Boundary and Topographic Survey for Orange County Pump Station #3190 (8036 South Orange Avenue.) the limits of the Topographic Survey extend 20' outside the boundary lines to the East, West and North and 100' to the South. Lands are lying within Orange County, Florida.

SURVEY EQUIPMENT/SOFTWARE

Topcon GTS – 212 Total Station
Trimble R8 GPS System
AutoCAD Civil 3D 2008

SURVEY DATA UTILIZED FROM THE FOLLOWING SOURCES:

Copies of the surveys, plats, and information referenced below or on the attached survey, were obtained from files and information at the following offices:

Orange County Property Appraisers web site – Plat Information
Orange County Comptroller web site – Official Records Site
Orange County Survey Dept. – Survey Control Points.
Orange County Info Map – Aerial Maps

FIELD MONUMENTATION:

All Controlling Monumentation for Boundary Corners and Benchmarks was recovered and its identification is shown on the survey.

The relative positional accuracy of measurements:

The relative positional accuracy of the lines and corners of this survey due to measurements is within the specifications for suburban survey, which is a maximum of: 1 foot in 10,000 feet.

SUBSURFACE UTILITY LOCATES

The locations of underground and above ground utilities are based on above ground structures, marking paint provided by Sunshine State One and Orange County Utilities.

HORIZONTAL AND VERTICAL CONTROL:

The horizontal survey data shown is based on control points established by the Orange County GIS Program having a local ground coordinate system based on the Florida State Plane Coordinate System, East Zone, and North American Datum 1983/1990 adjustment and based on Florida Department of Environmental Protection Certified Corner Records (CCR).

CCR # 72500. Being a railroad spike in cut-out. At the intersection of McCoy Road and Gondola Drive. Having a published coordinate of Northing: 1496855.156, Easting: 540685.247.

CCR # 72478. Being a Nail & Disk "RLS #1585" lying near the centerline of Sand Lake Road in the bridge over the CSX Railroad, West of Orange Avenue. Having a published coordinate of Northing: 1496830.977, Easting: 538022.346.

The vertical survey data is based on North American Vertical Datum NAVD 88, as provided by Orange County Survey Department and based on Benchmarks (BM).

BM #S1316049. Being a 3" Orange County Aluminum disk in concrete drop inlet west side of Orange Avenue at the Ardaman Center, 50'± south of the centerline of driveway. Having an elevation of 95.169.

BM #S1590003. Being a 3" Orange County Aluminum disk on the west side of 4' concrete sidewalk 0.4'± east of red brick wall, 2' south of concrete stairway to address 8022 Office Court. Having an elevation of 98.012.

Professional Surveyor and Mapper CERTIFICATE

The undersigned, a Registered Land Surveyor of the State of Florida does hereby certify that the attached Survey and Surveyor's Report were prepared under his direct supervision, and was executed in accordance with the requirements of the Florida Minimal Technical Standards as defined in 5J-17 of the Florida administrative code.

Refer to the Boundary & Topographic Survey's for Pump Station #3190, dated; May 08, 2014. This report is not full and complete without the map.

CERTIFIED BY: DATE: May 08, 2014

_____

Russell A. Brach, PSM #5299
APEX Engineering, Inc. – LB #6939
P.O. Box 568891
Orlando, Florida 32856

Appendix F
Sunrail CFRC Coordination and Permit Requirements

- CFRC Information Summary
- CFRC Right of Entry Application Additional Information
- General Use Permit (850-040-05)

CFRC INFORMATION SUMMARY

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Introduction

CORRIDOR INFORMATION

The Florida Department of Transportation (FDOT) is the owner of the Central Florida Rail Corridor (CFRC). The limits of the CFRC extend from MP 749.61 to MP 813.82 of the original CSX Transportation, Inc., A-Line. The purpose of this document is to provide information regarding potential future uses by others within the corridor.

CONTACT US

For permitting questions contact:

Florida Department of Transportation
420 W. Landstreet Rd.
Orlando, Florida
Attn: Richard Nasrawy, P.E. or Seta Koroitamudu, P.E.
(407) 858-5900
Or via email at: Richard.Nasrawy@dot.state.fl.us
or Seta.Koroitamudu@dot.state.fl.us

For construction questions contact:

Jim Martin, Public Information Manager
407-461-8926 or via e-mail at: jim@sunrail.com
Mike Wacht, Public Involvement Specialist
(407) 312-3481 or via e-mail at: mike@sunrail.com

For Surplus Leasing Program questions contact:

Florida Department of Transportation
719 S. Woodland Blvd.
DeLand, Florida
Attn: Todd Moynihan or Jack Adkins
(386) 943-5000
Or via email at: Todd.Moynihan@dot.state.fl.us
or Jack.Adkins@dot.state.fl.us

Other questions involving CFRC:

Call during business hours (8:00 AM to 5:00 PM): 407-492-0836
Email inquiries: www.sunrail.com or Marianne.Gurnee@dot.state.fl.us

To report a **railroad emergency**, please contact the **Central Florida Rail Coordination Center** at **1-877-235-7245 (or 1-877-CFL-RAIL)** immediately.

Use of the Corridor

OBTAINING PERMISSION

Entities desiring to make use of the corridor will need to obtain permission. Accessing the corridor without proper permission is trespassing. The FDOT has several standard permitting programs, such as utility and general use permitting, that apply to the corridor. Permission for uses falling within those standard permitting programs must be obtained pursuant to those standard programs. For proposed uses that do not fall within those standard permitting programs, the FDOT will consider granting permission to use the corridor under its standard surplus leasing program on a case by case basis.

DESIGN AND CONSTRUCTION

Additional Design Requirements

Please carefully review CFRC's design and construction requirements prior to designing a proposed use. These requirements can be found at the CFRC website at: www.sunrail.com as Additional Information documents for the various types of corridor uses.

All efforts should be made to comply with CFRC's standard requirements. You may request CFRC to review a design that does not meet the design requirements by submitting a variance proposal; however, approval is not guaranteed.

The American Railway of Engineering and Maintenance of Way Association (AREMA) is also a resource that could prove helpful in designing your project. The AREMA website is www.arema.org.

All occupancies should be designed and constructed so that rail operations and facilities are not interfered with, interrupted, or endangered. In addition, proposed facilities shall be located to minimize encumbrance to the corridor so that the railroad will have unrestricted use of its corridor for current and future operations. To assist you with preparing drawings, CFRC has identified the information required for FDOT staff to complete a review. See "Additional Information" on the www.sunrail.com website for details. The Additional Information documents outline the specific information required for various types of corridor uses. If the required information is not provided with the initial permit submittal, FDOT will issue an official Request for Additional Information (RAI) to obtain the required information. While this information may not be necessary for your particular operation or industry, it is required for FDOT to properly consider the proposal.

Construction Activity Requirements

The safety, security and integrity of CFRC rail operations is of paramount importance to FDOT. Each project is reviewed by FDOT independently to determine the need for inspection services,

On-Track Worker Protection/Training and Roadway Worker Protection/Training. Users will be responsible for the costs of these services and/or training.

- **On-Track Protection:** This service shall only be provided by an authorized firm under contract to FDOT to provide these protective services. The Chief Operating Officer (COO) of the CFRC (or designee) will review the details of the proposed work. Where there is a concern for safety or the integrity of the CFRC he/she will identify the type of On-Track Protection to be utilized and any other requirements for the time period requiring such protective services.

If On Track Protection Services and/or Roadway Worker Protection Training Services are required the contractor shall provide a minimum of 14 days advance notice to the COO (or designee) to arrange for the services.

- **Inspectors:** Inspection by FDOT representatives will be needed for:
    - Subgrade: Inspectors required for any project activity on CFRC
    - Aerial: Inspectors required for project set-up and final inspection
    - Depending on the nature of the project, additional experts may be required

  If Inspection Services are required the contractor shall provide a minimum of 14 days advance notice to the COO for inspection services.

- **Safety Awareness Training and Security Clearance:**
    - Safety Awareness Training and Security Clearance is required for all personnel requiring access to the CFRC railroad corridor. This training and clearance can occur prior to scheduling the project. All training must be complete prior to the day of beginning installation.
    - All workers on the corridor shall display the appropriate photo identification badge issued by the FDOT vendor that provides these services on behalf of the CFRC.
    - FDOT has contracted with e-Verifile.com, Inc. to provide the above services for the CFRC. Contact information for e-Verifile.com, Inc. is:

      Bill Aberson
      National Accounts Manager
      bill.aberson@everifile.com
      Phone: (404) 582-8814
      Fax: (404) 592 8839
      www.everifile.com

Fax: (770) 859-1174

- To begin the process to appropriate photo identification badge visit www.ers-shortline.com and click on the SUBSCRIBE NOW button.

- **Roadway Worker Protection Training:** Roadway Worker Protection (RWP) Training in accordance with 49 CFR Part 214 may be required for personnel working within 25 feet of the nearest rail within the CFRC railroad corridor. The requirement for RWP Training will be determined by the Chief Operating Officer (COO) of the CFRC (or designee). This training can occur prior to scheduling the project; however, all Roadway Worker Protection Training must be complete prior to the day of beginning installation. All workers on the corridor shall carry on their person at all times the appropriate certification for Roadway Worker Protection Training when on the corridor.

CFRC CORRIDOR RIGHT-OF-WAY MAPS AND OTHER DOCUMENT REQUESTS

Right-of-Way Maps for the CFRC are available for informational purposes to assist with your project references. These maps provide the width of the CFRC railroad corridor as well as other railroad nomenclature such as the milepost reference. The most convenient way of obtaining documents is to send an email request to: publicrecords.d5@dot.state.fl.us

INSURANCE

CFRC requires that insurance coverage be provided prior to any entry and/or work activity within the railroad corridor. Certificates of insurance, including naming the correct named insured(s) or additional insured(s), shall be provided as set forth in this section. The individual project permit or lease agreement defines the specific insurance requirements but for summary purposes, the following identifies the components:

Workers' Compensation Insurance:

Provide Workers' Compensation Insurance in accordance with the laws of the State of Florida and in amounts sufficient to secure the benefits of the Florida Workers' Compensation Law for all employees. If subletting any of the work, ensure that the employees of the subcontractors are covered by similar insurance. Ensure that any equipment rental agreements that include operators who are employees of independent Contractors, sole proprietorships or partners are covered by similar insurance. FDOT will accept equivalent approved protection in lieu of insurance.

Contractors' Public Liability and Property Damage Liability Insurance:

Provide regular Contractor's Public Liability Insurance, with respect to the operations performed, in the amount of $1,000,000 for all damages arising out of bodily injuries to, or

death of, one person and subject to that limit for each person, a total limit of $5,000,000 for

all damages arising out of bodily injuries to, or death of, two or more persons in any one occurrence. Provide regular Contractor's Property Damage Liability insurance providing for a limit of not less than $50,000 per occurrence and an aggregate limit of $100,000.

The following parties shall be each an additional insured party on the Applicant's Contractor's Protective Public Liability and Property Damages Liability Insurance policies that insure the Applicant for the described work that it performs under the permit or lease agreement:

1. Florida Department of Transportation,
2. National Railroad Passenger Corporation (a/k/a "Amtrak"),
3. Florida Central Railroad Company, Inc.,
4. Central Florida Commuter Rail Commission,
5. Volusia County,
6. Seminole County,
7. Orange County,
8. Osceola County, and
9. City of Orlando.

Contractors' Protective Public Liability and Property Damage Liability Insurance:
Provide regular Contractor's Protective Public Liability Insurance, with respect to the operations performed by subcontractors, in the amount of $1,000,000 for all damages arising out of bodily injuries to, or death of, one person and subject to that limit for each person, a total limit of $5,000,000 for all damages arising out of bodily injuries to, or death of, two or more persons in any one occurrence. Provide, with regard to subcontractors, regular Contractor's Property Damage Liability insurance providing for a limit of not less than $50,000 per occurrence and an aggregate limit of $100,000.

The following parties shall be each an additional insured party on the Applicant's Contractor's Protective Public Liability and Property Damages Liability Insurance policies that insure the Applicant for the described work that it performs under the permit or lease agreement:

1. Florida Department of Transportation,
2. National Railroad Passenger Corporation (a/k/a "Amtrak"),
3. Florida Central Railroad Company, Inc.,
4. Central Florida Commuter Rail Commission,
5. Volusia County,
6. Seminole County,
7. Orange County,
8. Osceola County, and
9. City of Orlando.

Insurance Required for Construction at Railroads:

General: In addition to any other forms of insurance or bonds required under the terms of the permit or lease, when the permit or lease includes the construction of a railroad grade crossing, overpass, or underpass structure, or a railroad crossing signal installation, or any other work or operations by the Contractor within the limits of the railroad right-of-way, including any encroachments thereon from work or operations in the vicinity of the railroad right-of-way, Applicant shall provide insurance of the types set forth below and in amounts not less than specified herein.

Railroads' Protective Public Liability and Property Damage Liability Insurance: Applicant shall furnish the Department with an original insurance policy that, with respect to the operations performed, will provide, in behalf of the railroad company regular liability insurance providing coverage for bodily injury, death, and property damage limited to a combined single limit of $2,000,000 per occurrence with an aggregate limit of $6,000,000 for the term of the policy.

CSX Transportation, Inc. and the Florida Department of Transportation are to be each a Named Insured on the policy. The following parties are to be each an additional insured party on the policy:

1. National Railroad Passenger Corporation (a/k/a "Amtrak"),
2. Florida Central Railroad Company, Inc.,
3. Central Florida Commuter Rail Commission,
4. Volusia County,
5. Seminole County,
6. Orange County,
7. Osceola County, and
8. City of Orlando.

Insurance for Protection of Utility Owners:

When the work under the permit or lease agreement involves work on or in the vicinity of utility-owned property or facilities, Applicant shall furnish the Department with evidence that, with respect to the operations performed, General Comprehensive Liability Insurance or its equivalent providing for a limit of not less than $1,000,000 for bodily injury or death to person(s) per occurrence and $300,000 property damage each occurrence is carried.

The Department and Utility Company are to be Additional Named Insured's, and the policy will be primary to any coverage maintained by the Department or Company. The following parties are to be each an additional insured party on the policy:

1. National Railroad Passenger Corporation (a/k/a "Amtrak"),
2. Florida Central Railroad Company, Inc.,
3. Central Florida Commuter Rail Commission,
4. Volusia County,
5. Seminole County,
6. Orange County,
7. Osceola County, and
8. City of Orlando.

Applicant shall not make any material change or cancellation to the policy without providing the Department with ten days prior written notice.

Submission and Approval of Policies; Termination:
Certificates of insurance (and other evidence of insurance requested by the Department) for each required policy shall be provided by Applicant prior to permit approval or execution of the lease agreement by the Department.

Applicant shall provide all insurance policies in such form and with insurers that are acceptable to the Department. Applicant shall keep such insurance in force, in the full amount specified herein, during the duration of the permit or the lease.

Insurance by Others:
Applicant shall require every subcontractor or other third party who may have a contract with Applicant and who may require access on or to the Department's property or railroad company property to obtain and maintain for the duration of such access an insurance policy or policies with coverage that satisfies the conditions stated in the paragraphs above on Workers' Compensation Insurance, and Contractors' Public Liability and Property Damages Liability Insurance, and Contractors' Protective Public Liability and Property Damage Liability, Insurance Required for Construction at Railroads, and Insurance for Protection of Utility Owners, and including causing each of the Named Insureds and the additional insureds stated in those paragraphs to be Named Insureds and additional insureds on such subcontractor or third party policy or policies.

ADDITIONAL INFORMATION FOR CORRIDOR USE

Project information and Plans/Drawings are required for review and approval of uses in the CFRC right-of-way. Information and supporting drawings and documents should be complete, clear, concise, and accurately reflect design scope of the project and the impact to the CFRC rail corridor or property. The nature of the project prescribes the information required for FDOT to complete a review. To assist you with preparing project information and drawings, CFRC has

provided additional Information documentation for applicants to provide the necessary information required for FDOT staff to complete a review for each use. Application Additional Information documents are provided for the following uses:

- CFRC Right of Entry Application
- CFRC Underground Installation Application - Pipeline
- CFRC Overhead Installation Application – Wireline
- CFRC Tower Installation Application
- CFRC Structure Application

Please note that review of each project is dependent upon all of the necessary information listed on the Additional Information being provided with the initial permit submittal. If not all required information is provided, FDOT will issue an official RAI to obtain the required data.

REVIEW FEES

At this time, there are no review fees for permits or applications submitted to FDOT for review and acceptance.

REVIEWS

FDOT will review each request independently for safety, engineering design and design requirement compliance, and both short-term and long-term impacts to railroad operations and property usage.

For permits, the standard review process provided by FDOT's permitting rules will apply.

For leases, the standard processing procedure for leasing surplus property in the FDOT's right-of-way procedures will apply.

The issuance of the Permit or Lease Agreement by FDOT will be the basis for scheduling all work activities on CFRC property. Activities within the CFRC corridor will be scheduled by the Chief Operating Officer once the permit has been issued or lease agreement has been signed by FDOT.

CFRC Chief Operating Officer will notify the applicant when activities can commence, including the coordination of the necessary inspection and/or protective services deemed necessary in the permit/agreement as identified in the review.

Appendix

Permitting and Lease Agreement Links

SUNRAIL WEBSITE: www.sunrail.com

Permit information location: See tab for Corridor Uses

PERMIT APPLICATIONS:

Permitting Instructions: Information Summary

Other Design Requirements: CFRC Design & Construction Requirements - Pipelines
CFRC Design & Construction Requirements – Wireline Occupancies
Bridges: FDOT Structures Manual
Interim Guidelines for Horizontal Directional Drilling
Sample Fraction Mitigation Plan for Horizontal Directional Drilling

Permit Applications:

Underground and Overhead Installations:	Utility Permit
Tower/Co-Location:	Utility Permit
Right of Entry:	General Use Permit
Existing Permit/Agreement:	General Use Permit
Bridges:	Lease Agreement

Other Links

CFRC Emergency Hotline: 1-877-CFL-RAIL

CFRC Right-of-Way Map request: publicrecords@dot.state.fl.us

General information regarding CFRC: 407-492-0836

American Railway Engineering Maintenance of Way Association: www.arema.org

FDOT Structures Manual:
http://www.dot.state.fl.us/Structures/StructuresManual/CurrentRelease/StructuresManual.shtm

Florida Administrative Code: https://www.flrules.org/

Utility Accommodation Manual: http://www.dot.state.fl.us/rddesign/utilities/UAM.shtm

FDOT Right-of-Way Manual:
http://www.dot.state.fl.us/rightofway/ProceduresManual.shtm

CFRC RIGHT OF ENTRY APPLICATION ADDITIONAL INFORMATION

There are two types of right of entry applications:

a) Application for Right of Entry for Temporary Purpose Only
b) Application for Right of Entry for Existing Facility with current Agreement /Permit

The following sections list the purpose and the needed information for each of Central Florida Rail Corridor (CFRC) Right of Entry application.

a) Right of Entry for Temporary Purpose Only

PURPOSE

This application is for conducting activity within or on the CFRC right-of-way that is not covered by an existing agreement or permit with FDOT and the work is of a temporary nature. Types of work efforts covered under this permit include:

- Surveys
- Environmental Investigations
- Ingress/Egress (short-term)
- Inspection (bridges, roads, etc.)
- Monitoring wells
- Soil boring or sampling
- Oversized equipment moving over operating track and/or right-of-way
- Environmental Remediation

APPLICATION INSTRUCTIONS

The applicant must submit the following:

1. Form

The applicant must submit four (4) copies of FDOT General Use Permit - Form # 850-040-05 with original signatures.

2. Supporting Information

The applicant must submit four (4) copies and one (1) electronic copy (in .pdf format) of the following information:

A. Project Location

i. City, county, and nearest roadway crossing
ii. Beginning and ending mile posts of work activities
iii. Estimated area of occupation
iv. Location of work activities and distance from the nearest rail

B. Project Information
   i. Estimated project cost
   ii. Starting and ending dates of temporary occupation
   iii. Who is requesting the work with contact information - phone number and email address
   iv. Consultant/Agent/Contractor information including company name, contact person, mailing address, phone number, and email address
   v. Date requesting flagging services if needed and duration of requested service

C. Project Description
   i. Purpose of work
   ii. Scope of work
   iii. Materials
   iv. Anticipated construction means and methods
   v. List the locations and specifications of anticipated construction equipment showing the minimum distance from the centerline of nearest track to the maximum equipment reach (maximum reach based on the equipment specifications not on the anticipated project equipment activities).
   vi. Geographic features
   vii. Type and number of site investigation and testing (if required),
   viii. Special conditions
   ix. Methods for crossing tracks during construction (if needed)

3. Supporting Drawings and Documents

The applicant must submit four (4) copies and one (1) electronic copy (in .pdf format) of the following:

A. Location maps/plans that indicate the following:
   i. Area of access on CFRC right-of-way
   ii. CFRC right-of-way extents in the project area
   iii. Street map with site location identified
   iv. Nearest public road
   v. Aerial photo with site location identified
   vi. Site specific location plan showing locations of all investigation points and their minimum distances to nearest track and any other rail structure (if any)
   vii. Photo log with pictures of the proposed project location. Site pictures shall be in all controlling directions including, but not limited to, North, East, South and West. The plan view should show a reference location and direction for each picture.
   viii. Equipment location
   ix. If environmental investigation is being requested, also include maps that indicate:
      - Ground water flow
      - Distribution of contaminants and soil
      - Distribution of contaminants and ground water

B. Detailed schedule including proposed dates, anticipated starting times and durations for each specific project activity.

C. A site safety plan documenting the scope of the activity proposed; equipment required; number of personnel on-site, their roles, the Point of Contact, current status of training of each; safety audits/oversight; emergency action plan; and personal protective equipment required.
D. Proof of current insurance as required by FDOT in accordance with the CFRC Information Summary.
E. Proof of current Security Clearance issued by e-Railsafe for all personnel proposed to enter the CFRC property.
F. Proof of current Safety Training as required by FDOT in accordance with the CFRC Information Summary.
G. Detailed explanation and specific circumstances why work has to be performed within 25 feet from the nearest track, if applicable.
H. Monitor well design including typical cross section, well security, installation methods, material casing, latitude and longitude coordinates, if applicable.
I. Description of management of Investigation Derived Wastes (IDW), if applicable.
J. Proof of financial capability or performance bond required for all monitor wells, piezometers & other facilities, if applicable.

APPLICATION SPECIAL INSTRUCTIONS

A. If the information submitted with the initial permit application is not complete or is incorrect, FDOT will issue an official Request for Additional Information (RAI) to obtain the required data.
B. Submission for Right of Entry approval will only permit the applicant to enter the CFRC Right-of-Way, for the purpose stated in the application and according to the design requirements as described in the supporting information and shown in the attachments.
B. Submission of this application does not authorize occupancy of the property.
C. Attached location maps/plans and detailed sketch shall show exact dimensions of the project area and distances to the centerline of the nearest railroad track and road crossing, bridge or other railroad structure (if any).
D. Investigation Derived Wastes (IDW) must be removed the same day it is generated, if applicable. The applicant is solely responsible for IDW management and disposal in accordance with local, state and federal regulations.
E. Test pits or test trenches are strongly discouraged. Approval will require a specific written management plan. All material generated from any test pit or trench activity is considered IDW. Test pits or trenches may not remain open and must be back-filled with suitable, certified, clean material before de-mobilizing from the site each day.
F. Monitoring well required for all monitor wells & piezometers
G. Only flush mounted wells are allowed.
H. A copy of the Permit must be kept on site at the work area at all times during the term of the Permit. The permit shall be shown to any representative of FDOT or CFRC upon demand. Project may be suspended if the Permit is not on site when requested.

b) Right of Entry for Existing Facility with current Agreement /Permit

PURPOSE

This application is for scheduling and approved activities within or on the CFRC right-of-way that is covered by an existing agreement or Permit including:

- Minor inspection/maintenance activities
- Replacement of an existing facility with like kind

APPLICATION INFORMATION

The applicant must submit the following:

1. Form

The applicant must submit four (4) copies of FDOT General Use Permit - Form # 850-040-05 with original signatures.

2. Supporting Information

The applicant must submit four (4) copies and one (1) electronic copy (in .pdf format) of the following information:

A. Project Location
   i. City, county, and nearest roadway crossing
   ii. Beginning and ending mile posts of work activities
   iii. Estimated area of occupation
   iv. Location of work activities and distance from the nearest rail

B. Project Information
   i. Estimated project cost
   ii. Starting and ending dates of occupation
   iii. Who is requesting the work with contact information - phone number and email address
   iv. Current agreement number and date
   v. Consultant/Agent/Contractor information including company name, contact person, mailing address, phone number, and e-mail address
   vi. Date requesting flagging services if needed and duration of requested service

C. Project Description
   i. Purpose of work
   ii. Scope of work
   iii. Materials
   iv. Anticipated construction methods
   v. List the locations and specifications of anticipated construction equipment showing the minimum distance from the centerline of nearest track to the maximum equipment reach (maximum reach based on the equipment specifications not on the anticipated project equipment activities).
   vi. Geographic features
   vii. Type and number of site investigation and testing (if required),
   viii. Special conditions

ix. Methods for crossing tracks (if needed)

3. Supporting Drawings and Documents

The applicant must submit four (4) copies and one (1) electronic copy (in pdf format) of the following information:

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   v. Aerial photo with site location identified
   vi. Site specific location plan showing locations of all investigation points and their minimum distances to nearest track and any other rail structure (if any)
   vii. Equipment location
   viii. If environmental investigation is being requested, also include maps that indicate:
      - Ground water flow
      - Distribution of contaminants and soil
      - Distribution of contaminants and ground water

B. Copy of current agreement

C. Detailed schedule including proposed dates, anticipated starting times and durations for each specific project activity.

D. A site safety plan documenting the scope of the activity proposed; equipment required; number of personnel on-site, their roles, the Point of Contact, current status of training of each; safety audits/oversight; emergency action plan; and personal protective equipment required.

E. Proof of current insurance as required by FDOT in accordance with the CFRC Information Summary.

F. Proof of current Security Clearance issued by e-RailSafe

G. Proof of current Safety Training as required by FDOT in accordance with the CFRC Information Summary.

H. Detailed explanation and specific circumstances why work has to be performed within 25 feet from the nearest track, if applicable.

I. Monitor well design including typical cross section, well security, installation methods, material casing, latitude and longitude coordinates, if applicable.

J. Description of management of Investigation Derived Wastes (IDW), if applicable.

K. Proof of financial capability or performance bond required for all monitor wells, piezometers & other facilities, if applicable.

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

GENERAL USE PERMIT

Date: _____ Permit No.: _____

Name of Applicant or Authorized Agent: _____

Entity (if applicable): _____

(If entity, furnish contact information for responsible representative)

Address: _____ Zip Code: _____

City/State: _____ Telephone No.: _____

Email Address: _____

Activity / Project Site

County: _____ State Road: _____ Section: _____

From Mile Post: _____ to Mile Post: _____

Construction Proposed or Underway: Yes ☐ No ☐ FM Project No.: _____

Name of Municipality if Work is within Limits: _____

Description of Work Activity: _____

_____

_____

_____

General Provisions

1. Attach any pertinent plans or drawings.
2. Attach notification letters sent to any Utilities both aerial and underground that will be potentially impacted.
3. The designated FDOT Engineer shall be notified 48 hours prior to beginning of work. Contact _____ at (_____) _____.
4. All work, materials and equipment shall be subject to inspection and approval by FDOT. Applicants certification of work at completion is required.
5. The permittee shall be responsible to place and display safety devices and proper maintenance of traffic in accordance with the latest version of the Department's Design Standards, index series 600, or an alternative plan signed and sealed by a professional Engineer and attached with the permit.
6. All FDOT property shall be restored to its original condition. Any damage to FDOT property as a result of this work shall be repaired and restored in a manner acceptable to the FDOT at the sole expense of the permittee.

Special Provisions

_____

_____

_____

_____

_____

Conditions

1. In the event the permittee fails to meet any of the requirements of this permit by the FDOT, the permitted activity must cease until brought into compliance. If compliance can not be met, then the permit will be rendered void and said work shall be removed from the right of way at no cost to the FDOT.

2. Work shall commence within _____ days of permit approval.
   Work shall be completed by _____.
   (Date)

3. The rights and privileges herein set out are granted only to the extent of the State's right, title and interest in the land to be entered upon and used by the permittee, and the permittee will, at all times, and to the extent permitted by law, assume all risk of and indemnify, defend and save harmless the State of Florida and the FDOT from and against any and all loss, damage, cost or expense arising in any manner on account of the exercise or attempted exercises by said permittee of the aforesaid rights and privileges.

Applicant

I hereby agree to comply with all terms and conditions set forth and described in this permit.

_____ _____ _____
Printed or Typed Name and Title | Signature | Date

FDOT

Approved By: _____ _____ _____
Print Designated Engineer | Signature | Date

_____
Title