



**Hillsborough  
County Florida**

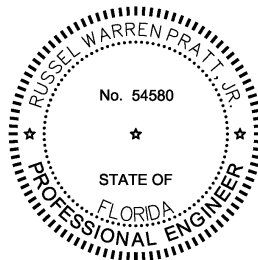


## **ENGINEERING DESIGN STANDARDS**

### **KRACKER AVENUE RESTORATION PROJECT HILLSBOROUGH COUNTY, FLORIDA**

## **TECHNICAL SPECIFICATIONS**

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THIS ITEM HAS BEEN DIGITALLY  
SIGNED AND SEALED BY RUSSELL WARREN PRATT, JR.

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT  
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AECOM TECHNICAL SERVICES, INC.  
7650 WEST COURTNEY CAMPBELL CAUSEWAY  
TAMPA, FLORIDA 33607  
CERTIFICATE OF AUTHORIZATION 8115  
RUSSEL WARREN PRATT, JR., P.E. NO. 54580

May 2020

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**END OF DIRECTORY**

## SECTION 01010 SUMMARY OF WORK

### PART 1 - GENERAL

- 1.01 SUMMARY: This SECTION summarizes the WORK of the Project as covered in detail in the complete Contract Documents. This is a general summary and is not intended to be complete and all-inclusive of the required WORK items. The WORK consists of the construction of wetland, stream and tidal lagoon habitat areas, backfilling/re-contouring over 220 small linear fish ponds, stabilizing and revegetating areas to native uplands and removing dilapidated buildings on a 25-acre parcel.

1.02 PROJECT DESCRIPTION:

Description of Total Project: The project area is located on the north side of Kracker Avenue, west of US 41, on land owned by Hillsborough County, Florida. The property is west of US 41 extending almost to Tampa Bay. The property entrance is at 6038 Kracker Avenue, Gibsonton, FL. Access is available from US41, but a temporary easement permit will be required from the FDOT.

The job site consists of approximately 220 linear excavated fish ponds and a derelict concrete structure that formerly housed a series of interior above-ground concrete fish tanks. The project will consist of clearing the existing non-native vegetation, backfilling old fish farm ponds, removing the dilapidated buildings and concrete ponds, and re-contouring the landscape to create mangrove islands, freshwater and tidal creeks, freshwater wetlands, and coastal and upland habitat. Culverts will be removed or replaced, and cuts made to connect the system to the stormwater ditch extending east to west along north side of Kracker Avenue and to the mangrove system on the northwest corner of the project.

1.03 RELATED CONTRACT ACTIVITIES:

- A. The preserve is a 25-acre property, formerly the site of Bramco Tropical Fish, was abandoned in the 1970s. Since then, the hundreds of shallow ponds where tropical fish were grown have been overtaken by invasive species. Hillsborough County and SWIM, working with the Bonefish and Tarpon Trust, will restore the site to a mosaic of habitats from uplands to very low salinity areas to intertidal lagoons and islands. The goal is to meet the specific needs of recreationally important fish including tarpon, redfish, sea trout and snook. An underground utility pipe conveying reclaimed water will direct the reclaimed water to flow through the site.
- B. CONTRACTOR shall not harm wildlife while accessing the project area. The Contractor shall consider coordination with County/Audubon/others on wildlife surveys prior to start of work.
- C. Temporary staging, laydown, and parking areas to be determined in coordination with and subject to approval by the DISTRICT and County staff. All areas to be located within the Parcel Boundary depicted in project drawings, unless otherwise acceptable to the DISTRICT and County.
- D. Development Services Review – Generation and storage of excess fill on-site may require coordination with, review and additional permitting by the Hillsborough County Development Services.

1.04 WORK PERFORMED BY OTHERS:

- A. The Contractor is responsible for connecting to the existing ditch at the southwest corner of the proposed intertidal lagoon (see section E of the project plans). The County is responsible for ditch maintenance downstream of the connection.
- B. Connection and installation of 8" PVC C-900 pipe to the energy dissipation structure Type "H" Inlet FDOT Index 233 will be performed by others.

1.05 CONTRACTOR'S USE OF PREMISES:

- A. During construction activities, the CONTRACTOR shall be responsible for maintaining all access roads in good condition, including grading and drainage.

- B. It shall be the CONTRACTOR's sole responsibility to repair all damages to roadways, bridges, and/or structures, which occur as a result of construction activities.

1.06 DISTRICT'S/COUNTY'S USE OF PREMISES

Partial DISTRICT/COUNTY Occupancy: The DISTRICT reserves the right to occupy and to place and install equipment in areas of the Project, prior to Substantial Completion provided that such occupancy does not interfere with completion of the WORK. Such placing of equipment and partial occupancy shall not constitute acceptance of the WORK.

1.07 WORK SEQUENCE, COORDINATION ACTIVITIES AND SCHEDULED DATES:

General: The CONTRACTOR shall coordinate its WORK with other adjacent contractors, landowners and DISTRICT and COUNTY activities, with specific attention to access and staging areas. The overall construction sequence shall be determined by CONTRACTOR subject to the needs for continuous access and operation by Hillsborough County.

- 1.08 COPIES OF DOCUMENTS: Complete sets of Bidding Documents shall be used in preparing Bids; Owner assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

1.09 LIST OF DRAWINGS:

- A. Contract Drawings:

1. Refer to Sheet 1 of the Contract Drawings

- B. Reference Materials:

The following reference materials are available for inspection at the offices of the DISTRICT: These materials are for reference only, are provided as-is, are not contractual documents, and do not replace the CONTRACTOR's due diligence in bid preparation.

- a. Southwest Florida Water Management District. Final Agency Action Transmittal Letter for Approval. Petition for Formal Determination of Wetlands and Other Surface Waters (July 2011)
- b. Arehna Engineering Inc. Project B-15-016 Report of Geotechnical Exploration – Thomas Tract Fish Farm (April 28 2015)
- c. Thomas Tract Survey – Revision 2 - SurvTech Solutions Inc.
- d. Thomas Tract Additional Topo Update SurvTech Solutions Inc. 10252017
- e. Phase I and Limited Phase II Environmental Site Assessment – Thomas Property. ChaistainSkillman Inc. (2012)
- f. Hillsborough County Thomas Property Phase II ESA Testing Locations – Results (pdf map)

END OF SECTION

SECTION 01050 FIELD ENGINEERING

**PART 1 - GENERAL**

1.01 SCOPE:

A. Summary of Work:

1. The CONTRACTOR shall engage a Professional Engineer of the discipline required, registered in the State of Florida, to perform engineering services for temporary facilities including the design of shoring systems, shores, earth and water retaining systems, forms, temporary erection supports, and similar items provided by the CONTRACTOR as part of its means and methods of construction.
2. The CONTRACTOR shall engage a Professional Surveyor and Mapper licensed in the State of Florida to perform all necessary construction layout surveys, horizontal and vertical control, As-Built (Record) Surveys, and Topographic Surveys in accordance with Chapter 472.027 of the Florida Statutes and Chapter 5J-17 Florida Administrative Code (FAC) and these specifications.

B. Related Work Specified Elsewhere:

1. SECTION 01300 - Submittals
2. SECTION 01700 – Contract Closeout
3. SECTION 02200 – Earthwork

1.02 SUBMITTALS:

- A. Submit in accordance with SECTION 01300.

**PART 2 - CONTRACTOR CONSTRUCTION STAKING**

2.01 DESCRIPTION: In connection with this WORK, CONTRACTOR shall be responsible for:

- A. Performing all construction layout survey tasks as necessary for construction and satisfactory completion of the WORK.
- B. Verifying benchmark elevations by running a level loop between a minimum of two (2) Project vertical control points prior to the construction layout survey or establishing Project elevation data and/or new benchmarks where necessary.
- C. Completing all leveling under the supervision of a Florida licensed Professional Surveyor and Mapper.
- D. Performing at a minimum two (2) daily check measurements with RTK Global Positioning System (GPS) on a minimum of two (2) different Project control monuments in two (2) different satellite geometric layouts.
- E. Performing a peg test as necessary on all level equipment with needed adjustments to maintain the accuracy of the instruments.
- F. Keeping a record of all survey work in a survey field book in a clear, orderly, and neat manner consistent with standard surveying practices.

2.02 CONSTRUCTION REQUIREMENTS:

- A. The CONTRACTOR's personnel performing the construction staking shall work under the direct supervision of a Florida licensed Professional Engineer or Florida licensed Professional Surveyor and Mapper. Submit name and address of individual responsible for surveying to the DISTRICT prior to start of survey activities.
- B. The CONTRACTOR shall be solely and completely responsible for the accuracy of the line and grade of all features of the WORK. Any errors or apparent discrepancies found in previous surveys, plans, or specifications shall be called to the attention of the DISTRICT by the CONTRACTOR for correction or interpretation prior to proceeding with the WORK.

- C. Field notes shall be kept in standard, bound field notebooks in a clear, orderly, and neat manner consistent with standard engineering and/or surveying practices.
- D. The CONTRACTOR shall be responsible for the placement and preservation of adequate ties and reference to all control points, whether established by him or found on the Project, necessary for the accurate reestablishment of all base lines or centerlines shown on the Drawings. All land ties (i.e. section corners, fractional section corners, and similar items) that may be lost or destroyed during construction shall be carefully referenced and replaced.
- E. The supervision of the CONTRACTOR's construction engineering personnel shall be the responsibility of the CONTRACTOR; any deficient engineering layout or construction WORK which may be the result of inaccuracies in his staking operations or of his failure to report inaccuracies found in WORK previously done by the Design Engineer shall be corrected at the expense of the CONTRACTOR.
- F. Station Identification: On linear elements of construction (such as levees, canals, and similar items) the CONTRACTOR shall place temporary identifying signs at intervals no greater than 500 feet using four (4) foot sections of one (1) inch by four (4) inches lumber driven into the ground. The signs shall identify the station at that location.
- G. In order to expedite the commencement of construction operations, the staking operation may commence prior to the issuance of the Notice to Proceed. The CONTRACTOR shall obtain written approval of the DISTRICT prior to commencing staking.

## 2.03 SURVEY STANDARDS:

- A. Vertical Data:
  - 1. All vertical data shall be collected and displayed in North American Vertical Datum 88 (NAVD 88). All Vertical elevation control level runs shall start and end on National Geodetic Survey (NGS) Second Order or higher DISTRICT approved vertical control monuments. The CONTRACTOR shall use a minimum of two (2) different NGS Second Order or DISTRICT approved published benchmarks that are a minimum of one-half mile apart. The level run(s) between monuments must close on each other. If the monuments do not close on each other the surveyor shall re-do the level runs or use another NGS monument until the two (2) monuments used in the level run close. The level run shall close to within 0.03 feet times the square root of the distance in miles.
- B. All Vertical elevation control level runs shall start and end on National Geodetic Survey (NGS) Second Order or higher DISTRICT approved vertical control monuments.
  - 1. All new Water Control Structures shall require at a minimum one (1) new Site benchmark to be set if one does not exist. A survey disk (supplied by the DISTRICT) stamped with the Site designation or DISTRICT approved alternative shall be permanently grouted into the water control structure provided it is on a portion of the structure that does not have an expansion joint. The marker for the benchmark can be obtained from the DISTRICT Project Manager (PM). The CONTRACTOR shall only stamp or engrave the benchmark identification and not the elevation. If a NGS Class "B" mark is set, the survey disk is not required and the designation shall be stamped on the benchmark cap.
  - 2. If elevations need to be converted to NGVD 29, use the CORPSCON 6.0.1 with the Corps of Engineers, South Atlantic Division's "vertcon 05.txt" file added.
- C. A DISTRICT benchmark description sheet shall be completed for each benchmark established (set) for use in the Project. A DISTRICT benchmark description sheet shall be requested; if applicable, from the DISTRICT PM at the pre-construction meeting.
- D. Horizontal Data (State Plane Coordinates):
  - 1. All horizontal data shall be collected in and based on the North American Datum (NAD 1983/2007) adjustment or higher. Horizontal coordinate control shall be established from existing NGS or DISTRICT approved Second Order control or higher in the area by using a minimum of conventional NGS Third Order field observation procedures. All horizontal work

shall be done in the same horizontal adjustment (no mixing of the adjustments). Once the horizontal datum has been established, it shall not change for the life of the project.

2.04 RECORDS AND SUBMITTALS:

A. Submittal:

1. Provide DISTRICT a copy of the designs described in Paragraph 1.01 signed and sealed by the Florida registered Professional Engineer.
2. Provide DISTRICT the data required for the individual responsible for layout and records as required in Paragraph 2.02 A.
3. Provide DISTRICT one (1) copy of the Preliminary Surveyor's Report (MS Word 2007 or later), and two (2) copies of the final signed, sealed and certified Surveyor's Report to the DISTRICT.
  - a. At a minimum, the report shall include: an overall Project description, location sketches, field notes, equipment used, pictures and an NAD 83/99 state plane coordinate (RTK) on each new bench mark (if applicable).
  - b. A CD containing: Surveyor's name and logo, Surveyor's Report, digital pictures, benchmark description sheets and any other associated data.

B. Records/As-builts: At the end of the Project, submit to the DISTRICT a certified Site survey showing coordinates and elevations of the completed WORK. These are part of the record documents required in SECTION 01700.

1. The CONTRACTOR shall provide one (1) set of conventional certified As-Built Survey overlaid on the Drawings.
2. The CONTRACTOR shall provide a single PDF file with all data attached to that file and bookmark the As-Built.
3. The CONTRACTOR shall provide single AutoCAD (version 2010 or later) digital files for each of the certified hard copies.

C. Cross-sections: Cross-sections shall be submitted as specified in SECTION 02200.

END OF SECTION

SECTION 01065 PERMITS AND FEES

**PART 1 - GENERAL**

- 1.01 Unless otherwise specified, the CONTRACTOR shall obtain and pay for any permits and licenses related to his work as provided for in the General Terms & Conditions, except as otherwise provided herein.
- 1.02 The CONTRACTOR will be issued copies of all permits obtained by the DISTRICT at the pre-construction conference. A copy of the permits shall be posted at the site at all times during construction. The CONTRACTOR shall be responsible for familiarizing himself with the permits and shall abide by the permit conditions at all times.
- 1.03 WORK shall be conducted, and shall result in construction of the improvements of this project, in full accordance with the conditions of the permits granted for the project.

END OF SECTION



## SECTION 01071      STANDARD REFERENCES

Wherever used in the project manual, the following abbreviations will have the meanings listed:

AA	Aluminum Association Incorporated 818 Connecticut Avenue, NW Washington, DC 20006
AABC	Associated Air Balance Council 1518 K Street NW Washington, DC 20005
AAMA	American Architectural Manufacturers Association 2700 River Road, Suite 118 Des Plaines, IL 60018
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, NW, Suite 225 Washington, DC 20001
ABMA	American Bearing Manufacturers Association 2025 M Street, NW Suite 800 Washington, DC 20036
ACI	American Concrete Institute 38800 Country Club Drive Farmington Hills, MI, 48331
AEIC	Association of Edison Illuminating Companies 600 18 <sup>th</sup> Street N Birmingham, Al 35203
AFBMA	Anti-Friction Bearing Manufacturers Association
AGA	American Gas Association 400 N. Capital Street, NW Suite 450 Washington, DC 20001
AGMA	American Gear Manufacturer's Association 500 Montgomery Street, Suite 350 Alexandria, VA 22314
AHA	American Hardboard Association 1210 West Northwest Hwy Palatine, IL 60067
AISC	American Institute of Steel Construction One East Wacker Drive, suite 700 Chicago, IL 60601
AISI	American Iron and Steel Institute 1000 16th Street, NW Washington, DC 20036

AITC	American Institute of Timber Construction 333 West Hampden Avenue Englewood, CO 80110
ALSC	American Lumber Standards Committee P. O. Box 210 Germantown, MD 20874
AMCA	Air Movement and Control Association, Inc. 30 West University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute, Inc. 25 West 43 <sup>rd</sup> Street New York NY 10036
APA	American Plywood Association P.O. Box 11700 Tacoma, WA 98411
API	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
AHRI	Air-Conditioning Heating and Refrigeration Institute 1814 North Fort Myer Drive Arlington, VA 22209
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017
ASCII	American Standard Code for Information Interchange United States of America Standards Institute 10 East 40th Street New York, NY 10016
ASE	American Standard Safety Code for Elevators, Dumbwaiter and Escalators American National Standards Institute/ASME A17.1/CSA B44 1430 Broadway New York, NY 10018
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers United Engineering Center 1791 Tullie Circle, N.E. Atlanta, GA 30329
ASME	American Society of Mechanical Engineers Three Park Avenue New York, NY 10016
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103

AWPA	American Wood Preservers Association P.O. Box 361784 Birmingham, AL 35236
AWPB	American Wood Preservers Bureau 7962 Conell Court P. O. Box 5283 Lorton, VA 22079
AWPI	American Wood Preservers Institute 1945 Old Gallows Road, Suite 150 Vienna, VA 22182
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165
AWS	American Welding Society 550 NW Lejune Road Miami, FL 33126
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 17 <sup>th</sup> Floor New York, NY 10017
BOCA	Building Officials and Code Administrators 17926 Halstead Homewood, IL 60430
CBMA	Certified Ballast Manufacturers Association 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of America (Formerly called: Overhead Electrical Crane Institute) (OECI) 8720 Reds Oak Boulevard, Suite 201 Charlotte, NC 28217
CRSI	Concrete Reinforcing Steel Institute 933 North Plum Grove Road Schaumburg, IL 60173
CSA	Canadian Standards Association 155 Queen Street, Suite 1300 Ottawa, Ontario, CA K1P6L1
DEMA	Diesel Engine Manufacturer's Association 122 East 42nd Street New York, NY 10017

DHI	Door Hardware Institute 14150 Newbrook Drive, Suite 200 Chantilly, VA 20151
DIS	Division of Industrial Safety California Department of Industrial Relations 2422 Arden Way Sacramento, CA 95825
EEI	Edison Electric Institute 701 Pennsylvania Avenue, NW Washington, DC 20004
EIA	Electronic Industries Alliance 2001 Eye Street, NW Washington, DC 20006
EJMA	Expansion Joint Manufacturer's Association 25 North Broadway Tarrytown, NY 10591
EPA	Environmental Protection Agency Region 4 Sam Nunn Atlanta Federal Center 61 Forsyth Street, SW Atlanta, GA 30303-3104
EPC	Hillsborough County Environmental Protection Commission Roger P. Stewart Center 3629 Queen Palm Drive Tampa, FL 33619
ESO	Electrical Safety Order, California Administrative Code, Title 8, Chap. 4, Subarticle 5 Office of Procurement, Publications Section P. O. Box 20191 8141 Elder Creek Road Sacramento, CA 95820
FAC	Florida Administrative Code
FDACS	Florida Department of Agriculture and Consumer Services The Mayo Building Fifth Floor, M12 407 S. Calhoun St. Tallahassee, FL 32399-0800
FDEP	Florida Department of Environmental Protection 3900 Commonwealth Boulevard, M.S. 49 Tallahassee, Florida 32399
FDOT	Florida Department of Transportation 605 Suwannee Street Tallahassee, Florida 32399-0450

FEDSPEC	Federal Specifications General Services Administration Specification and Consumer Information Distribution Branch Washington Navy Yard, Bldg. 197 Washington, DC 20407
FEDSTDs	Federal Standards (see FEDSPEC)
FLEPPC	Florida Exotic Pest Plant Council
FM	Factory Mutual Research 1151 Boston-Providence Turnpike Norwood, MA 02062
FWC	Florida Fish and Wildlife Conservation Commission 620 South Meridian Street Tallahassee, FL 32399-1600
GANa	Glass Association of North America 800 SW Jackson Street, Suite 1500 Topeka, Kansas 66612
HEI	Heat Exchange Institute 1300 Summer Avenue Cleveland, OH 44115
HI	Hydraulic Institute 1230 Keith Building Cleveland, OH 44115
HPVA	Hardwood Plywood and Veneer Association 1825 Michael Faraday Drive Reston, VA 20190
IAPMO	International Association of Plumbing and Mechanical Officials 5001 E. Philadelphia Street Ontario, CA 91761
ICBO	International Conference of Building Officials 5360 South Workman Mill Road Whittier, CA 90601
ICEA	Insulated Cable Engineers Association P. O. Box P South Yarmouth, MA 02664
ICRI	International Concrete Repair Institute 10600 West Higgins Road, Suite 607 Rosemont, IL 60018
IEEE	Institute of Electrical and Electronics Engineers, Inc. 3 Park Avenue, 17 <sup>th</sup> Floor New York, NY 10016-5997

IES	Illuminating Engineering Society c/o United Engineering Center 120 Wall Street Floor 17 New York, NY 10005
ISA	Instrument Society of America 67 Alexander Drive Research triangle Park, NC 27709
ISO	International Organization for Standardization 1, ru de Varembe, Case Postale 56 CH-1211 Genna 20, Switzerland
JIC	Joint Industrial Council 7901 Westpark Drive McLean, VA 22101
MFMA	Metal Framing Manufacturers Association 401 Michigan Avenue Chicago, IL 60611
MILSPEC	Military Specifications Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. 127 Park Avenue, N.E. Vienna, VA 22180
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt rd bldg C, Suite 312 Glen Ellyn, IL 60137
NACE	National Association of Corrosion Engineers P. O. Box 986 Katy, TX 77450
NEC	National Electrical Code National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814
NELMA	Northeastern Lumber Manufacturers Association, Inc. 272 Turtle Road P. O. Box 87A Cumberland Center, ME 04021

NEMA	National Electrical Manufacturer's Association 1300 N. 17 <sup>th</sup> Street, Suite 1752 Rosslyn, VA 22209
NESC	National Electric Safety Code American National Standards Institute 1430 Broadway New York, NY 10018
NETA	InterNational Electrical Testing Association 3050 Old Centre Avenue, Suite 102 Portage, MI 49024
NFP	National Forest Products Association (Formerly National Lumber Manufacturer's Association) 1619 Massachusetts Avenue Washington, DC 20036
NFPA	National Fire Protection Association Batterymarch Park Quincy, MA 02269
NHLA	National Hardwood Lumber Association P. O. Box 34518 Memphis, TN 38184-0518
NIST	National Institute of Standards and Technology 100 Bureau Drive, Suite 1070 Gaithersburg, MD 20899-1070
NSF	National Sanitation Foundation P.O. Box 130140 789 N. Dixoboro Road Ann Arbor, MI 48113
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational and Health Administration San Francisco Regional Office 200 Constitution Avenue Washington, DC 20210
PCI	Prestressed Concrete Institute 200 W. Adams Street, Suite 2100 Chicago, IL 60606
PPIC	The Plumbing & Piping Industry Council, Inc. 135 Calle Catalina Place Houston, TX 77007
RIS	Redwood Inspection Service California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523
RLM	Reflector and Lamp Manufacturers Standard Institute

RMA	Rubber Manufacturers Association 1400 K Street Washington, DC 20005
SAE	Society of Automotive Engineers 400 Commonwealth Drive Warrendale, PA 15096
SBC	Standard Building Code Published by SBCCI
SMC	Standard Mechanical Code Published by SBCCI
SBCCI	Southern Building Code Congress International 1116 Brown-Marx Building Birmingham, AL 35203
SCMA	Southern Cypress Manufacturers Association 805 Sterick Bldg. Memphis, TN 38103
SDI	Steel Door Institute 30200 Detroit road Westlake, OH 44145
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. 4201 Lafayette Center Drive Chantilly, VA 20151
SPC	Society for Protective Coatings 40 24 <sup>th</sup> Street, 6 <sup>th</sup> Floor Pittsburgh, PA 15222
SPI	Society of the Plastics Industry, Inc. 1667 K Street, NW Suite 1000 Washington, DC 20006
SPIB	Southern Pine Inspection Bureau P.O. Box 10915 Pensacola, FL 32524
SSPC	The Society for Protective Coatings (formerly called: Steel Structures Painting Council) 40 24 <sup>th</sup> Street, 6 <sup>th</sup> Floor Pittsburgh, PA 15222-4656
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
SWFWMD	Southwest Florida Water Management District 2379 Broad Street Brooksville, FL 34604-6899



TEMA	Tubular Exchanger Manufacturer's Association 3251 Corte Malpaso, Suite 507 Camarillo, CA 93012
UL	Underwriters Laboratories Inc. 2600 NW Lake Road Camas, WA 98607
USBR	Bureau of Reclamation U.S. Department of Interior Engineering and Research Center Denver Federal Center, Building 67 Denver, CO 80225
USACE	United States Army Corps of Engineers Jacksonville District P. O. Box 4970 Jacksonville, FL 32232-0019
WCLIB	West Coast Lumber Inspection Bureau 6980 SW Varns Street P. O. Box 23145 Tigard, OR 97223
WWPA	Western Wood Products Association (Formerly called: West Coast Lumbermen's Association (WCLA)) 522 SW 5 <sup>th</sup> Avenue, Suite 500 Portland, OR 97204

END OF SECTION

## SECTION 01150

### MEASUREMENT AND PAYMENT

#### 1.1 GENERAL

- A. All pay items under this contract shall be paid for in accordance with this section.
- B. Contingency Allowance: The Contractor shall not use Contingency Allowance without written approval from the Owner.
- C. The Contractor shall accept compensation provided under the terms of this Contract as full payment for furnishing all materials and for performing all work contemplated and embraced under this Contract. Such compensation shall also be for any and all loss or damage arising out of the nature of the work, or from the action of the elements, or from any unforeseen difficulties or obstruction encountered during the Contract period until final acceptance by the Owner.
- D. The Contractor shall prepare and submit a Schedule of Values and Progress Schedule to the Engineer for approval. The Schedule of Values and Progress Schedule shall be the primary means of control of the Work and will be the basis for scheduling all work and for determination of progress payments. The Schedule of Values shall subdivide the work into its component parts for each lump sum pay item below in sufficient detail to serve as the basis for estimating percent complete to support progress payments during construction. An unsupportable or unreasonable allocation of the contract lump sum price to any one of the activity and/or work items shall be justification for the rejection of the Schedule of Values. The total sum of the individual values in the Schedule of Values for each of the activities shall equal the total lump sum contract price minus contingency.
- E. Any item not indicated in the Bid Response Form but shown on the plans, shall be included as part of the lump sum quantity for Mobilization.
- F. It is the Contractor's responsibility to perform a detailed quantity take-off from the plans to determine actual quantities for ordering and delivery purposes. The Owner will not be responsible for quantities ordered in excess of those installed and constructed.
- G. The Owner shall withhold a retainage on each progress payment in accordance with the contract documents. Retainage shall be released to the Contractor upon satisfaction of all contractual obligations and the final acceptance of the completed work by the Owner.
- H. The Contractor shall consider both the construction plan set in conjunction with the technical specifications and contract documents in developing their bid. As specified in 1.1.E above, the cost for any item that is identified on the construction plans, but not included in the Bid Response Form shall be included in the lump sum quantity for Mobilization.

## 1.2 PAY ITEM DESCRIPTIONS

### 1. Mobilization

- A. General: The work specified under this section shall consist of the preparatory work and operations necessary to mobilize and begin work on the project. This shall include, but is not limited to, construction layout survey; those operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; the establishment of temporary offices, buildings, safety equipment and first-aid supplies, sanitary and other facilities required by these Contract documents; compliance with all applicable federal, state and local regulations; preparation and implementation of a stormwater pollution prevention plan; and all project documentation, including but not necessarily limited to video photography and aerial photography, specified by these Contract documents. This item also includes installation of project signage.

The cost of Bonds and any other required insurance, consideration for indemnification to the Owner and the Engineer, and any other pre-construction expenses necessary for the start of the work, excluding the cost of construction materials, shall also be included in this section.

- B. Payment: The work specified under this section shall be paid for at the Contract lump sum price for Mobilization and shall be in accordance with the following schedule:

PERCENT OF ORIGINAL CONTRACT AMOUNT EARNED	ALLOWABLE PERCENT OF THE LUMP SUM PRICE FOR MOBILIZATION
5	25
10	50
25	75
50	100

Partial payment shall be limited to ten percent (10%) of the original Contract amount for the project. Any remaining amount will be paid upon completion of all work on the project, including final punch list work items. The applicable work specified under this section shall be paid for under the following Pay Item (and/or other similar project specific phasing):

- Bid Item No. 1: Mobilization – lump sum

### 2. Maintenance of Traffic

- A. General: The work specified in this Bid Item consists of maintaining traffic within the limits of the project for the duration of the construction period including any temporary suspensions of the work. It shall include the construction and maintenance of any necessary detour facilities; the providing of necessary facilities for access to residences, schools, businesses, etc. along the project; the furnishing, installing and maintaining of traffic control and safety devices during construction, the control of dust, and any other special requirements for safe and expeditious movement of traffic as may be called for on the Contract Drawings, including any

required MOT permitting efforts. The term, MOT, as used herein, shall include all of such facilities, devices and operations as are required for the safety and convenience of the public as well as for minimizing public nuisance.

- B. Payment: The work specified under this section shall be paid for at the Contract lump sum price for Maintenance of Traffic and shall be in accordance with the following schedule:

PERCENT OF ORIGINAL CONTRACT AMOUNT EARNED	ALLOWABLE PERCENT OF THE LUMP SUM PRICE FOR MOBILIZATION
5	25
10	50
25	75
50	100

Partial payment shall be limited to ten percent (10%) of the original Contract amount for the project. Any remaining amount will be paid upon completion of all work on the project, including final punch list work items. The applicable work specified under this section shall be paid for under the following Pay Item (and/or other similar project specific phasing):

- Bid Item No. 2: Maintenance of Traffic – lump sum

3. Clearing, Grubbing and Demolition

- A. General: The work specified under this section shall consist of the removal and disposal of all existing structures and buildings including foundations, utilities and septic tanks, timber and brush except where otherwise indicated, stumps and roots, existing pavement, and all debris in all areas where work on excavations, embankments, pavements and structures (including pipe culverts and other pipelines) is to be done as shown or reasonably implied in the drawings and in accordance with the specifications.
- B. Payment: The pay quantity for Clearing and Grubbing shall be paid for at the Contract lump sum price for all work and materials described above. The applicable work specified under this section shall be paid for under the following Pay Item:

- Bid Item No. 3: Clearing and Grubbing – lump sum

4. Erosion Control Devices and Turbidity Barrier

- A. General: The work specified under this section shall include furnishing all labor and materials to install, inspect and maintain the erosion control and/or turbidity barriers surrounding the project work as shown on the drawings or as required by the Florida Department of Environmental Protection ERP or the Army Corps of Engineers (ACOE) Permit. Separate pay items will be used for floating turbidity barriers vs. staked turbidity barriers. The work shall include anchoring either the floating or staked barrier by 4-inch posts at all ends.
- B. Payment: The pay quantities for the work specified under this section shall be paid

for at the Contract lump sum price for staked silt fence and turbidity barrier and per each for construction entrance. The work specified under this section shall be paid for under the following Pay Items (and/or other similar project specific phasing):

- Bid Item No. 4a: Staked Silt Fence (Type III) – lump sum
- Bid Item No. 4b: Soil Tracking Prevention Device – per each
- Bid Item No. 4c: Floating Turbidity Barrier – lump sum
- Bid Item No. 4d: Staked Turbidity Barrier – lump sum

5. Dewatering

- A. General: The work specified under this section shall consist of all dewatering, bypass pumping, and surface water control in accordance with the plans and specifications. All temporary construction including culverts, pipe, berms, rip rap and channels is included in this pay item. This pay item includes all required permits for dewatering. Erosion protection associated with dewatering activities and bypass pumping shall be included in this pay item. Removal of dewatering and bypass pumping equipment, associated temporary facilities, and site restoration of areas impacted by dewatering and bypass pumping shall be included in this pay item.
- B. Payment: The pay quantity for Dewatering shall be one lump sum quantity which shall include all work and materials described above. The applicable work specified under this section shall be paid for under the following Pay Item:

- Bid Item No. 5: Dewatering – lump sum

6. Earthwork

- A. General: The work specified under this section shall consist of excavating, filling, compacting, and grading all embankments, channels, subgrades, shoulders, and side slopes in accordance with the alignment, grade and cross-sections shown or reasonably implied in the drawings and in accordance with the specifications. Work shall include all compaction testing required by the plans and specifications. Work shall also include furnishing fill (borrow) materials, hauling and disposal of all excess material, and hauling and disposal of all unsuitable materials. Specifically excluded is all earthwork associated with underground utility installations including stormsewers and storm structures with the exception of encountered solid waste.
- B. Payment: The pay quantities for work specified under this section shall be lump sum to complete earthwork to the lines a grades indicated on the Plans and verified by as-built survey prepared by a licensed surveyor certified in the State of Florida of the entire project area. The applicable work specified under this section shall be paid for under the following Pay Items:

- Bid Item No. 6: Earthwork – lump sum

7. Storm Drainage Construction

- A. General: The work specified under this section shall include all labor, equipment and materials necessary for installing the Type H Ditch Bottom Inlet as shown on the Plans, which includes all grading, dewatering, sheeting/bracing, excavation, #67 crushed stone bedding material, backfilling and compacting.
- B. Payment: The pay quantities for work specified under this section shall be per each based on the number of stormwater structures installed. The applicable work specified under this section shall be paid for under the following Pay Item:

- Bid Item No. 7: FDOT Type H Ditch Bottom Inlet – per each

No additional payment shall be made for work associated with trench safety.

No additional payment shall be made for that geotechnical information required to support those conditions set forth.

No additional payment shall be made for excavation of unsuitable materials.

8. Rubble Rip Rap Ditch Lining

- A. General: This bid item describes measurement and payment for rubble riprap ditch lining furnished and placed. The unit bid price includes all labor, equipment, excavation, hauling, and incidental items necessary to accomplish the work.
- B. Payment: Payment for rubble rip rap ditch lining shall be lump sum. The price quoted shall include the hauling, placement, and installation of the rubble rip rap and shall be paid for under the following Pay Items:

- Bid Item No. 8a: Class I Rubble Rip Rap at Energy Dissipator Structure – lump sum
- Bid Item No. 8b: Class I Rubble Rip Rap at Pond No. 1 – lump sum
- Bid Item No. 8c: Class I Rubble Rip Rap at Pond No. 2 – lump sum
- Bid Item No. 8d: Class II Rubble Rip Rap at Tarpon Pond – lump sum
- Bid Item No. 8e: Class I Rubble Rip Rap at Low Water Crossing – lump sum
- Bid Item No. 8f: Class I Rubble Rip Rap at Tidal Marsh and Kracker Avenue Ditch – lump sum

9. Bedding Stone Under Rubble Rip Rap Ditch Lining

- A. General: This bid item describes measurement and payment for the bedding stone under the rubble riprap ditch lining furnished and placed. The unit bid price includes all labor, equipment, excavation, hauling, and incidental items necessary to accomplish the work.
- B. Payment: Payment for the bedding stone under the rubble rip rap ditch lining shall

be lump sum. The price quoted shall include filter fabric, hauling, placement, and installation of the bedding stone and shall be paid for under the following Pay Items:

- Bid Item No. 9a: Bedding Stone Under Class I Rubble Rip Rap at Energy Dissipator Structure – lump sum
- Bid Item No. 9b: Bedding Stone Under Class I Rubble Rip Rap at Pond No. 1 – lump sum
- Bid Item No. 9c: Bedding Stone Under Class I Rubble Rip Rap at Pond No. 2 – lump sum
- Bid Item No. 9d: Bedding Stone Under Class II Rubble Rip Rap at Tarpon Pond – lump sum
- Bid Item No. 9e: Bedding Stone Under Class I Rubble Rip Rap at Low Water Crossing – lump sum
- Bid Item No. 9f: Bedding Stone Under Class I Rubble Rip Rap at Tidal Marsh and Kracker Avenue Ditch – lump sum

10. Cellular Confinement System for Low Water Crossing

- A. General: This bid item describes measurement and payment for the cellular confinement system for the low water crossing and shall include full compensation for the construction of the low water crossing, including geocell material, all necessary anchoring, gravel infill material and all appurtenances required for a complete installation.
- B. Payment: Payment for the cellular confinement system shall be lump sum. and shall be paid for under the following Pay Item:
- Bid Item No. 10: Cellular Confinement System for Low Water Crossing – lump sum

11. Grassing

- A. General: The work specified under this section consists of furnishing all labor and materials to seed and mulch or sod all disturbed areas, as designated in the construction plans. This item shall include watering, fertilization and maintenance until the project is accepted by the Owner.
2. Payment: The pay quantity for the work specified under this section shall be lump sum. The work specified under this section shall be paid for under the Pay Item:
- Bid Item No. 11a: Seed and Mulch – lump sum
  - Bid Item No. 11b: Sodding - lump sum

12. Plants and Installation

- A. General: The work included under this section consists of planting and maintenance of the wetland and upland plant species of the type, size, and quantity indicated in the plans, in accordance with specifications, and requirements, or as directed by the Project Manager or authorized representative. Planting areas are to be constructed by the Contractor.

- B. Payment: Plants and Installation specified under this section shall be the per each unit price by species. The Planting Allowance is for additional quantity of plants at the Contractor's bid price authorized by the Owner. Watering Events are for post 90-day acceptance watering authorized by the Owner shall be paid for per event up to the number of events estimated on the bid form. Applicable work specified under this section shall be paid for under the following Pay Items:

- Bid Item No. 12a: Arrowhead (*Sagittaria lancifolia*), BR
- Bid Item No. 12b: Black Needlerush (*Juncus Roemerianus*), BR
- Bid Item No. 12c: Blueflag iris (*Iris Virgincia*), BR
- Bid Item No. 12d: Fragrant water lily (*Nymphaea odorata*), BR
- Bid Item No. 12e: Knotted Spikerush (*Eleocharis interstincta*), BR
- Bid Item No. 12f: Marsh hay cordgrass (*Spartina patens*), BR
- Bid Item No. 12g: Saltmarsh bulrush (*Schoenoplectus robustus*), 2 inch
- Bid item No. 12h: Sand cordgrass (*Spartina bakeri*), BR
- Bid Item No. 12i: Sawgrass (*Cladium jamaicense*), 2 inch
- Bid Item No. 12j: Seashore paspalum (*Paspalum vaginatum*), BR
- Bid Item No. 12k: Smooth cordgrass (*Spartina alterniflora*), BR
- Bid Item No. 12l: Softstem bulrush (*Schoenoplectus tabernaemontani*), 2 inch
- Bid Item No. 12m: Planting Allowance
- Bid Item No. 12n: Watering Events

13. Demobilization

- A. General: Demobilization shall be the work of removing temporary facilities, project signs, erosion control, temporary fencing, etc. from the site and the updating and preparation of record drawings ("As-Built" Drawings). Preparation the as-built drawings includes a survey performed a surveyor certified in the State of Florida. The as-built drawings shall demonstrate the project is constructed in accordance with the plans and specifications.
- B. Payment: The work specified under this section shall be paid for under the lump sum Pay Item:

Deleted:

- Bid Item No. 13: Demobilization – lump sum

14. Plant Maintenance

1. General: The work included under this section consists of maintenance of native plant species located within the project boundary. Exotic and nuisance vegetation shall be controlled in accordance with the specifications. Plant Maintenance events shall be conducted quarterly for up to three years.
2. Payment: Plant Maintenance shall be paid per quarterly event.
3. Pay Items: Applicable work specified under this section shall be paid for under the



following Pay Items:

- Bid Item No. 14a: Quarterly Plant Maintenance – Year 1 – per quarter
- Bid Item No. 14b: Quarterly Plant Maintenance – Year 2 – per quarter
- Bid Item No. 14c: Quarterly Plant Maintenance – Year 3 – per quarter

15. Contingency Allowance

- A. General: The work specified under this section consists of performing additional work beyond the original contract scope as directed by the Owner.
- B. Payment: Payment for miscellaneous work outside of the original contract scope will be made only for work specifically authorized by the Owner in writing. Prior to beginning the work, the Owner and Contractor will agree on a unit price or lump sum price for the additional work. The work specified under this section shall be paid for under the Pay Item:

- Bid Item No. 15: Contingency Allowance

END OF SECTION

## SECTION 01200 PROJECT MEETINGS AND REPORTS

### PART 1 - GENERAL

1.01 SUMMARY: This Section includes the following administrative and procedural requirements:

- A. Project Meetings:
  - 1. Preconstruction conference
  - 2. Progress meetings
- B. Schedules and Reports:
  - 1. Initial coordination submittals
  - 2. Construction progress schedule (See SECTION 01310 Construction Schedules)
  - 3. Special reports

1.02 PROJECT MEETINGS:

- A. Pre-construction Conference
  - 1. The DISTRICT will administer a meeting within 10 days after the Effective Date of the Agreement, to review items stated in the following agenda and to establish a working understanding between the parties as to their relationships during conduct of the Work.
  - 2. Preconstruction conference shall be attended by:
    - a. CONTRACTOR and his superintendent
    - b. Representatives of principal Subcontractors and Suppliers
    - c. Engineer and his Resident Project Representative if any
    - d. DISTRICT or its representative
    - e. County or its representatives
    - f. Other affected parties determined by the DISTRICT
  - 3. Agenda:
    - a. Projected construction schedules
    - b. Critical Work sequencing
    - c. Designation of responsible personnel
    - d. Project coordination
    - e. Procedures and Processing of:
      - i. Field decisions
      - ii. Substitutions
      - iii. Submittals
      - iv. Change Orders
      - v. Applications for payment
    - f. Procedures for testing
    - g. Procedures for maintaining record documents
    - h. Use of Premises:

- i. Office, work and storage areas
    - ii. DISTRICT'S requirements
  - i. Construction facilities, controls, and construction aids
  - j. Temporary utilities
  - k. Safety and first aid
  - l. Security
  - m. Requirements of any permits obtained by the DISTRICT
4. Location of Meeting: District office.

B. Progress Meetings:

1. The DISTRICT will administer a meeting a minimum of twice each month (every two weeks) and at other times requested by the DISTRICT. CONTRACTOR, Engineer and all Subcontractors active on the site shall be represented at each meeting. CONTRACTOR may request attendance by representatives of his Suppliers and other Subcontractors, or other entities concerned with current program or involved with planning, coordination or performance of future activities. All participants in the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. CONTRACTOR and each Subcontractor shall be prepared to discuss the current construction progress report, any anticipated future changes to the schedule, and advise if their current progress or future anticipated schedules are compatible with the Work.
3. If one Subcontractor is delaying another, CONTRACTOR shall direct such changes as are necessary for those involved to mutually agree on schedule changes in the best interest of construction progress.
4. Agenda
  - a. Review of construction progress since previous meeting
  - b. Field observations, interface requirements, conflicts
  - c. Problems which impede construction schedule
  - d. Off-site fabrication
  - e. Delivery schedules
  - f. Submittal schedules and status
  - g. Site utilization
  - h. Temporary facilities and services
  - i. Hours of Work
  - j. Hazards and risks
  - k. Housekeeping
  - l. Quality and Work standards
  - m. Change orders
  - n. Documentation of information for payment request
  - o. Corrective measures and procedures to regain projected schedule if necessary
  - p. Revisions to construction schedule
  - q. Progress and schedule during succeeding Work period

- r. Review proposed changes for:
      - i. Effect on construction schedule and on completion date
      - ii. Effect on other contracts of the Project
    - s. Other business
  - 5. Location of Meetings: Project site.
  - 6. Reporting: After each meeting, minutes of the meeting will be distributed to each party present and to parties who should have been present.
- C. Special Reports:
- 1. When an event of an unusual and significant nature occurs at the site, a special report shall be prepared and submitted. List the chain of events, persons participating, response by CONTRACTOR'S personnel, an evaluation of the results or effects, and similar pertinent information. Advise the DISTRICT in advance when such events are known or predictable.

END OF SECTION

## SECTION 01300 SUBMITTALS

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. This SECTION includes definitions, descriptions, transmittal, and review of "Compliance" and "Miscellaneous" Submittals.

#### 1.02 GENERAL INFORMATION:

##### A. Definitions:

1. Compliance Submittals include Shop Drawings, product data, and samples which are prepared by the CONTRACTOR, Subcontractor, MANUFACTURER, or Supplier and submitted by the CONTRACTOR to the DISTRICT as a basis for approval of the use of Equipment and Materials proposed for incorporation in the WORK or needed to describe installation, operation, maintenance, or technical properties.
  - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
  - b. Product data includes standard printed information on materials, products and systems not custom-prepared for this Project, other than the designation of selections from available choices.
  - c. Samples include both fabricated and unfabricated physical examples of materials, products, and WORK; both as complete units and as smaller portions of units of WORK; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of samples which are too large to be handled in the specified manner for transmittal of sample Submittals.
2. Miscellaneous Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or samples.
  - a. Technical reports include laboratory reports, tests, technical procedures, technical records, CONTRACTOR's design analysis and CONTRACTOR's survey field notes for construction staking, before cross-sections and after cross-sections.
  - b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, workmanship bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, as-constructed data, security/protection/safety data, and similar type Submittals.
  - c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the MANUFACTURER or Supplier is called for in the Specifications.
  - d. Reports as required by Contract describing CONTRACTOR's means and methods for items such as dewatering, existing embankment protection, earth and water retaining, erosion/turbidity control, and safety plans.
3. Refer to ARTICLE 1.03 and 1.04 of this Part for detailed lists of documents and specific requirements.

##### B. Quality Requirements:

1. The CONTRACTOR shall submit all Project related correspondences including, but not limited to Request for Information (RFI), Submittals, miscellaneous correspondences, etc. in writing and/or

in digital PDF format by electronic transmission to the DISTRICT Project Manager. Submittals that require a professional or corporate seal or certification shall provide one signed and sealed original as well as a copy in digital format.

2. Submittals such as Shop Drawings and product data shall be of the quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.
  3. Documents submitted to the DISTRICT that do not conform to these requirements shall be subject to rejection by the DISTRICT, and upon request by DISTRICT, CONTRACTOR shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. CONTRACTOR's (or his Subcontractor's) failure to initially satisfy the legibility quality requirements will not relieve CONTRACTOR (or his Subcontractors) from meeting the required schedule for Submittal of Shop Drawings and product data.
- C. Language and Dimensions:
1. All words and dimensional units shall be in the English language.
  2. Metric dimensional unit equivalents may be stated in addition to the English units.
- D. Submittal Completeness:
1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable the DISTRICT to review the information effectively.
  2. Where standard drawings are furnished which cover a number of variations of the general class of equipment, each such drawing shall be individually annotated to describe exactly which parts of the drawing apply to the equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" is not an acceptable means of annotating Submittals. Such annotation shall also include proper identification of the Submittal permanently attached to the drawing.
  3. Reproduction or copies of Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. The CONTRACTOR may use a reproduction of the DISTRICT-prepared Contract Drawings for erection drawings such as to indicate information on erection or to identify detail drawing references. Where the Drawings are revised to show this additional CONTRACTOR information, the DISTRICT's title block shall be replaced with a CONTRACTOR's title block and the DISTRICT's professional seal shall be removed from the Drawing. The CONTRACTOR shall revise these erection drawings for subsequent DISTRICT revisions to the Contract Drawings.

### 1.03 COMPLIANCE SUBMITTALS:

- A. Items shall include, but not be limited to, the following:
1. MANUFACTURER's specifications
  2. Catalogs, or parts thereof, of manufactured equipment
  3. Shop fabrication and erection drawings
  4. General outline drawings of equipment showing overall dimensions, location of major components, weights, and location of required building openings and floor plates
  5. Detailed equipment installation drawings, showing foundation details, anchor bolt sizes and locations, baseplate sizes, location of DISTRICT's connections, and all clearances required for erection, operation, and disassembly for maintenance.
  6. Schematic diagrams for electrical items, showing external connections, terminal block numbers, internal wiring diagrams, and one-line diagrams

7. Bills of material and spare parts list
8. Instruction books and operating manuals
9. Material lists or schedules
10. Performance tests on equipment by MANUFACTURERS
11. Concrete mix design information
12. Samples and color charts
13. All drawings, calculations, catalogs or parts thereof, MANUFACTURER's specifications and data, samples, instructions, and other information specified or necessary:
  - a. For DISTRICT to determine that the Equipment and Materials conform with the design concept and comply with the intent of the Contract Documents.
  - b. For the proper erection, installation, operation and maintenance of the Equipment and Materials which the DISTRICT will review for general content but not for substance.
  - c. For the DISTRICT to determine what supports, anchorages, structural details, connections, and services are required for the Equipment and Materials, and the effects on contiguous or related structures and Equipment and Materials.

B. Schedule and Log of Compliance Submittals:

1. Prepare for the DISTRICT, a schedule and log for submission of all Compliance Submittals specified or necessary for DISTRICT's review of the use of Equipment and Materials proposed for incorporation in the WORK or needed for proper installation, operation or maintenance. Submit the schedule and log with the procurement schedule and WORK progress schedule. Schedule submission of all Compliance Submittals to permit review, fabrication, and delivery in time so as to not cause a delay in the WORK of CONTRACTOR or his Subcontractors or any other contractors as described herein.
2. In establishing schedule for Compliance Submittals, allow fifteen (15) working days in DISTRICT's office for reviewing original Submittals and ten (10) working days for reviewing resubmittals.
3. The schedule shall indicate the anticipated dates of original submission, and shall be prepared in accordance with SECTION 01310.
4. Schedule all Compliance Submittals required prior to fabrication or manufacture for submission within 90 days of the Notice to Proceed. Schedule Compliance Submittals pertaining to storage, installation and operation at the Site for DISTRICT's acceptance prior to delivery of the Equipment and Materials.
5. Resubmit Compliance Submittals the number of times required for DISTRICT's "Submittal Accepted." However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining acceptance of Submittals, will not be grounds for extension of the Contract Time, provided the DISTRICT completes its reviews within the times stated above.

C. Transmittal of Compliance Submittals:

1. All Compliance Submittals and related correspondences shall be submitted to the DISTRICT by CONTRACTOR.
2. All Compliance Submittals of Equipment and Materials furnished by Subcontractors, MANUFACTURERS, and Suppliers shall be submitted to the DISTRICT by CONTRACTOR electronically in PDF format or in written format.
3. After checking and verifying all field measurements, transmit all Compliance Submittals to the DISTRICT for acceptance as follows:

- a. Identify each Compliance Submittal by Submittal Number, Project name and number, Contract title and number, and the Specification SECTION and article number marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
  - b. Check and stamp Compliance Submittals of Subcontractors, Suppliers, and MANUFACTURERS with CONTRACTOR's approval prior to transmitting them to the DISTRICT. CONTRACTOR's stamp of approval shall constitute a representation to the DISTRICT that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or he assumes full responsibility for doing so, and that he has coordinated each Compliance Submittal with the requirements of the WORK and the Contract Documents.
  - c. At the time of each submission, call to the attention of DISTRICT in the letter of transmittal any deviations from the requirements of the Contract Documents.
  - d. Make all modifications noted or indicated by DISTRICT and return revised prints, copies, or samples until accepted. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by the DISTRICT on previous Submittals. After Submittals have been accepted, submit copies thereof for final distribution. Prints of accepted drawings transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.
  - e. Following completion of the WORK and prior to final payment, furnish those drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in equipment instruction books as required. All such copies shall be clearly marked "AS BUILT DRAWING."
  - f. WORK requiring a Compliance Submittal shall not be commenced or shipped until the Submittal has been stamped "Submittal Accepted" or "Submittal Accepted as Noted" by the DISTRICT.
  - g. Keep a copy or sample of each Compliance Submittal in good order at the Site.
4. Copies of the equipment CONTRACTOR's erection drawings and other Compliance Submittals required for the installation of equipment furnished by others under separate Contract for installation under this Contract will be transmitted to CONTRACTOR by the DISTRICT in the final distribution of such Submittals.
  5. Information to MANUFACTURER's District Office: MANUFACTURERS and Suppliers of Equipment and Materials shall furnish copies of all agreements, drawings, specifications, operating instructions, correspondence, and other matters associated with this Contract to the MANUFACTURER's district office servicing the DISTRICT. Insofar as practicable, all business matters relative to Equipment and Materials included in this Contract shall be conducted through such local district offices.
- D. DISTRICT's Review:
1. The DISTRICT will review and return Compliance Submittals to CONTRACTOR with appropriate notations. Instruction books and similar Submittals will be reviewed by the DISTRICT for general content but not for substance.
  2. The DISTRICT's acceptance of Compliance Submittals will not relieve CONTRACTOR from his responsibility as stated in Contract Documents.
- E. Compliance Submittal Action Stamp:
1. The DISTRICT's review action stamp or designation, appropriately completed, will appear on all Compliance Submittals of CONTRACTOR when returned by the DISTRICT. Review status designations listed on DISTRICT's action stamp are defined as follows:



- a. "ACCEPTED AS SUBMITTED": Signifies Equipment or Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is acceptable for incorporation in the WORK. CONTRACTOR is to proceed with fabrication or procurement of the items and with related WORK.
- b. "ACCEPTED AS NOTED": Signifies Equipment and Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is acceptable for incorporation in the WORK subject to the condition that as constructed it shall be in accordance with all notations and/or corrections indicated. CONTRACTOR is to proceed with fabrication or procurement of the items and with related WORK in accordance with DISTRICT's notations.
- c. "RETURNED FOR REVISION": Means that deviations from the requirements of the Contract Documents exist in the submittal. CONTRACTOR is to resubmit revised information responsive to DISTRICT's annotations on the returned Submittal or written in the letter of transmittal. Fabrication or procurement of items represented by the Submittal and related WORK is not to proceed until the Submittal is approved.
- d. "NOT ACCEPTABLE (SUBMIT ANEW)": Signifies Equipment and Material represented by the Submittal does not conform with the design concept or comply with the intent of the Contract Documents and is disapproved for use in the WORK. CONTRACTOR is to resubmit Compliance Submittals responsive to the Contract Documents.
- e. "PRELIMINARY SUBMITTAL": Signifies Submittals of such preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract Documents must be deferred until additional information is furnished. CONTRACTOR is to submit such additional information to permit layout and related activities to proceed.
- f. "FOR REFERENCE ONLY": Signifies Submittals which are for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to the DISTRICT in design, operation, or maintenance, but which by their nature do not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. The DISTRICT reviews such Submittals for general content but not for substance.
- g. "DISTRIBUTION COPY (PREVIOUSLY ACCEPTED)": Signifies Submittals which have been previously accepted and are being distributed to CONTRACTOR, DISTRICT, Resident Project Representative, and others for coordination and construction purposes.

F. Instruction Books / Operation & Maintenance Manuals:

- 1. Equipment instruction books and manuals shall be prepared by the MANUFACTURER and shall include the following:
  - a. Index and tabs
  - b. Instructions for installation, start-up, operation, inspection, maintenance, parts lists and recommended spare parts, and data sheets showing model numbers
  - c. Applicable drawings
  - d. Name of contact person, phone number, and address of the nearest authorized service facility
  - e. Attached to the above shall be a notice of the exact warranty effective dates, beginning and ending.
  - f. All additional data specified
- 2. Information listed above shall be submitted electronically in a PDF file format and also be bound into hard-back binders of three-ring type. Sheet size shall be 8-1/2 inches x 11 inches. Binder

color shall be yellow for Electrical and Electronics and brown for Miscellaneous Equipment. Capacity shall be a minimum of 1-1/2 inches, but sufficient to contain and utilize sheets with ease.

- a. Instruction Books/Operation & Maintenance Manuals shall contain the following:
  - i. Equipment name
  - ii. MANUFACTURER's name
  - iii. Project name
  - iv. Contract number
  - v. Reference to applicable Drawing No. & Technical Specifications Section
- b. Format: The overall manual should be constructed around certain types of structures or equipment in the Project, and not merely assembled by technical specification section, so that all pertinent data needed by personnel to operate or maintain the equipment or structure is in one (1) manual (as far as is practical). The CONTRACTOR shall coordinate with the DISTRICT as to how the manuals are to be assembled.

G. Samples:

1. Office samples shall be of sufficient size and quantity to clearly illustrate the following:
  - a. Functional characteristics of the product, with integrally related parts and attachment devices
  - b. Full range of color, texture, and pattern

1.04 MISCELLANEOUS SUBMITTALS:

- A. Miscellaneous Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the WORK, but do not require DISTRICT's approval prior to proceeding with the WORK. Miscellaneous Submittals may include but are not limited to (at DISTRICT's discretion):
  1. Field test reports
  2. Soil test reports
  3. Temperature records
  4. Shipping or packing lists
  5. Job progress schedules
  6. Equipment and Material delivery schedules
  7. Progress photographs
  8. Warranties and guarantees
  9. Surveying field notes, preliminary and final Surveyor's Reports
  10. Pump tests
  11. Traffic control plan
- B. Transmittal of Miscellaneous Submittals:
  1. All Miscellaneous Submittals furnished by Subcontractors, MANUFACTURERS, and Suppliers shall be submitted to DISTRICT by CONTRACTOR electronically in PDF format where practical, unless otherwise specified.
    - a. Identify each miscellaneous Submittal by Project name and number, Contract title and number, and the specification section and article number marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.

- b. Check and stamp Miscellaneous Submittals of Subcontractors, Suppliers, and MANUFACTURERS with CONTRACTOR's approval prior to transmitting them to the DISTRICT. CONTRACTOR's stamp of approval shall constitute a representation to the DISTRICT that CONTRACTOR has either determined and verified all information, or he assumes full responsibility for doing so, and that he has coordinated Miscellaneous Submittal with the requirements of the WORK and the Contract Documents.
  - c. At the time of each submission, call to the attention of the DISTRICT in the letter of transmittal any deviations from the requirements of the Contract Documents.
  - d. Make all modifications noted or indicated by DISTRICT and return revised prints, or copies until accepted. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by the DISTRICT on previous Submittals. After Submittals have been accepted, submit copies thereof for final distribution.
2. Test Reports:
- a. Responsibilities of CONTRACTOR and DISTRICT regarding tests and inspections of Equipment and Materials and completed WORK are set forth elsewhere in these Contract Documents.
  - b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute test reports in an electronic PDF file format to the following in addition to submitting test reports electronically to the DISTRICT :
    - i. DISTRICT's Consultant
    - ii. District Project Manager
    - iii. CONTRACTOR
    - iv. MANUFACTURER or supplier
- C. DISTRICT'S Review:
- 1. DISTRICT will review Miscellaneous Submittals for indications of WORK or material deficiencies within fifteen (15) working days in DISTRICT's office for original Submittals and ten (10) working days for reviewing resubmittals.
  - 2. DISTRICT will respond to CONTRACTOR on those Miscellaneous Submittals which indicate WORK or material deficiency.

## **PART 2 - PRODUCTS (Not applicable)**

## **PART 3 - EXECUTION**

### **3.01 SUBMITTAL LOG:**

- A. CONTRACTOR shall maintain an accurate Submittal Log and a Distribution List for the duration of the WORK, showing current status of all Submittals and Distributees at all times in a form acceptable to the DISTRICT. CONTRACTOR shall make the Submittal Log available to the DISTRICT for its review on request, and shall bring a copy of the Submittal Log to all Progress Meetings.

END OF SECTION

## SECTION 01310 CONSTRUCTION SCHEDULES

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. **CONSTRUCTION SCHEDULE** (Construction Schedule): The WORK under this Contract shall be planned, scheduled, executed, and reported by the CONTRACTOR. The CONTRACTOR shall adhere to established technical standards for CPM (Critical Path Method) scheduling using the computerized PDM (Precedence Diagram Method), unless otherwise directed by the DISTRICT. The CONTRACTOR is required to provide all Construction Schedules in electronic format.
- B. The CONTRACTOR shall submit a detailed Construction Baseline Schedule (Baseline Schedule) showing all WORK required under the Contract and scheduled within the time constraints set forth under the Contract. The DISTRICT will review and comment on the Baseline Schedule submittal as per 2.03. Upon acceptance, the CONTRACTOR shall not change the accepted Baseline Schedule without prior concurrence of the DISTRICT. The Baseline Schedule shall be updated to show actual progress. Any proposed changes in the schedule activities, original duration, logic, activity constraints, other than progress, shall be incorporated into a request for a revision to the accepted Baseline Schedule and submitted for review and acceptance.
- C. The CONTRACTOR shall be responsible for coordinating its own schedules (including subcontractors) as well as the construction activities of others as required to fully execute the WORK.

#### 1.02 SOFTWARE/INTERFACE REQUIREMENTS:

- A. The CONTRACTOR shall use the latest version of Microsoft Project or approved equivalent for creating and updating all Construction Schedules and reports.

#### 1.03 QUALITY ASSURANCE:

- A. The CONTRACTOR shall perform the WORK covered by this SECTION with personnel having substantial experience in scheduling software on construction projects which required the development and maintenance of the schedule throughout the Project duration.
- B. It is the responsibility of the CONTRACTOR to work with each subcontractor and supplier to obtain information pertinent to the planning and updating of their respective activities in the schedules.

#### 1.04 DEALING WITH SUBSTITUTES:

- A. All versions of the CONTRACTOR's Construction Schedule shall be based solely on the WORK as awarded, and shall exclude any substitute proposals, even if the CONTRACTOR pursues a substitution in accordance with the provisions of the Contract.
- B. The DISTRICT's final determination on any proposed substitutions may not be made until after the CONTRACTOR's Construction Schedule is prepared and accepted. Accepted proposed substitutions shall be identified in the schedule as Change Orders.

#### 1.05 USE OF FLOAT:

Total Float is the amount of time a scheduled activity can be delayed without delaying the completion of the WORK beyond the contractually required end date. Contract Float is the number of days between the CONTRACTOR's anticipated date for early completion of the WORK, or specified part, and the corresponding Contract Time. Total Float and Contract Float belong to the Project and are not for the exclusive benefit of any party. Contract Float and Total Float shall be available to the DISTRICT, consultants, or the CONTRACTOR to accommodate changes in the WORK or to mitigate the effect of events which may delay performance or completion. The DISTRICT will monitor and optimize the use of float for the benefit of the Project.

1.06 EARLY COMPLETION:

- A. An early completion schedule is one which anticipates completion of all or a specified part of the WORK ahead of the corresponding Contract Time. Since Contract and Total Floats belong to the Project, the CONTRACTOR shall not be entitled to any extension in Contract Time or recovery for any delay incurred because of extensions in an early completion date until all Contract Float is used or consumed and performance or completion of the WORK extends beyond the Contract Time. The accepted Baseline Schedule must have a single longest path with zero Total Float. Multiple longest paths are not acceptable.

1.07 NON-COMPLIANCE:

- A. The DISTRICT may refuse to recommend/authorize a progress payment in the event of the CONTRACTOR's failure, refusal or neglect to provide the required schedule information, since this will preclude the proper evaluation of the CONTRACTOR's progress. Remedies for the CONTRACTOR's failure, neglect or refusal to comply with the requirements of this SECTION are in addition, and not limited to, those provided under other sections of the Contract.

**PART 2 - PRODUCTS**

2.01 GENERAL CRITERIA:

- A. All Construction Schedules shall be prepared by the CONTRACTOR and reflect the CONTRACTOR's plans, means and methods, techniques and sequences for performing of the WORK.
- B. The Construction Schedules shall break down the WORK into distinct activities with interdependencies to the extent required to clearly depict the planned approach for completion of the WORK and to effectively manage the execution of the WORK.
  - 1. The Construction Schedules shall divide the WORK into manageable and logical segments and specify the progression from the Notice to Proceed (NTP) to Substantial Completion (SC) to Final Completion (FC) within Contract Time.
  - 2. The Construction Schedule is to include, at minimum, appropriate time allowances for submittals, procurement, coordination with others, construction, start-up/check-out (if applicable), operational and performance testing (if applicable), commissioning (if applicable), and Contract Close-Out.
  - 3. Site-related activities shall not reflect a combination of work located in separate structures, work corresponding to different divisions of the specifications, work performed by first and second tier subcontractors or rough-in and finish work of the same trade.
  - 4. The NTP activity shall be the first activity in the schedule and shall be a Start Milestone, with an assigned 7-day, no holiday calendar. The SC and FC activities shall be Finish Milestones, with assigned "Finish on or Before" constraints, with the Contract SC and FC dates assigned to the constraints, with a 7-day, no holiday calendar.
  - 5. The CONTRACTOR's Construction Schedule shall include preparation, review and acceptance of Shop Drawings, material fabrication and material deliveries. The first submittal review and acceptance activity durations shall be fifteen (15) working days. Resubmittal review and acceptance cycles shall have activity durations of ten (10) working days. The CONTRACTOR shall include only the first submittal review and acceptance cycle for each submittal in the Construction schedule. If more than one cycle for a submittal occurs, the CONTRACTOR shall add that cycle to the schedule at the time it occurs. Additional submittal, review and acceptance cycles will require a revision to the Baseline Schedule.
- C. The CONTRACTOR shall schedule any requirements (such as submittal reviews) of the DISTRICT, the DESIGN CONSULTANT and others (performing WORK for the DISTRICT) indicated in, or required by the Contract Documents. The Construction Schedule shall incorporate appropriate activities and WORK sequences based upon the Contract Documents.

## 2.02 CONSTRUCTION SCHEDULE SUBMITTAL:

- A. The Construction Schedule submittal, which refers to both the Baseline Schedule and all Schedule Updates, are to consist of the following items:
  - 1. An electronic file containing PDF formats of all required reports and graphics, including a written narrative.
  - 2. An electronic backup of the Construction Schedule in Microsoft Project format, or approved equivalent.
  - 3. For Schedule Updates, a copy of the payment application is required. The Period Ending date in the DISTRICT Application for Payment must match the Data Date of the corresponding Schedule Update.
- B. The Schedule Narrative Report for the Construction Schedule shall consist of a written description of how the WORK will be accomplished in accordance with the planned Construction Schedule. The Schedule Narrative accompanying each Schedule Update shall, at a minimum, compare current progress to the accepted baseline schedule for all milestones and activities, including longest path activities. If there are potential or actual delays, the narrative shall state the cause of the delay and impact to the Construction Schedule and define steps that have been taken or intend to be taken to mitigate delay impacts. The CONTRACTOR shall list any proposed changes in network activities and logic that will need to be incorporated into a revision to the Baseline Schedule. The narrative shall provide sufficient detail to allow the DISTRICT to verify the progress of the WORK, compare actual versus planned activities, and identify assumptions made in scheduling work, including Change Order work. The CONTRACTOR shall direct specific attention, in writing, to adjustments or corrections made, either in response to the DISTRICT's comments on the previous submittal or otherwise. A Schedule Narrative Report must be provided for all Baseline Schedules and Schedule Updates even if there are no detailed comments for each sub-heading.
  - 1. Schedule Narrative Report
    - a. The Schedule Narrative Report shall show the following sub-headings with detailed comments:
      - i. Progress, issues, delays, and claims
      - ii. Schedule changes, including out-of-sequence work
      - iii. Milestones
      - iv. Critical submittals and Procurement items
      - v. Response to DISTRICT Review comments from previous submittal on an item by item basis.
    - b. It shall be an electronic color PDF – 8 ½ x 11 portrait format file.

## 2.03 INITIAL AND REVISED CONSTRUCTION BASELINE SCHEDULE:

- A. The CONTRACTOR shall submit their Initial Construction Baseline Schedule to the DISTRICT in accordance with the General Conditions. It will be reviewed for conformance to the requirements of the Contract Documents.
- B. Schedule Naming Structure: Once the Initial Construction Baseline Schedule is accepted, it becomes the CONTRACTOR's Baseline Schedule Revision 0 and is the basis for monitoring the CONTRACTOR's progress against milestones, Contract Time, and the evaluation and reconciliation of extensions in Contract Time. From then on, all activities, original durations, and their relationships may not be changed, added, or deleted without the prior approval of the DISTRICT. The CONTRACTOR's Baseline Schedule Revision 0 must be revised when it is no longer useful as a status and control mechanism as determined by the DISTRICT. All changes must be coordinated with and approved by the DISTRICT. Contract Time (including all contracted milestones) cannot be changed without a formal Change Order approved by the DISTRICT. When a revision to the Baseline Schedule is required, a new revised Baseline Schedule shall be submitted in accordance with change procedures, for review and acceptance by the DISTRICT.

#### 2.04 CONSTRUCTION SCHEDULE UPDATES:

- A. A Schedule Update is a copy of the accepted Baseline Schedule with progress added. Progress is Duration % Complete.
- B. The Schedule Update must be submitted by the CONTRACTOR each month with each pay application or as directed by the DISTRICT. The Schedule Update will indicate actual performed WORK and WORK forecast through Project completion. The actual schedule data shall record when WORK was performed. Forecast data will be calculated by the schedule.
- C. All out of sequence activities that originally had a finish to start relationship, but became a Start to Start or Finish to Finish relationship must be corrected in the Schedule Update. For other out of sequence relationships, a revision to the baseline is required.

### **PART 3 - EXECUTION**

#### 3.01 MONTHLY UPDATE CYCLE:

- A. Schedule Update Submittals are due every 30 days and are to be attached to each Application for Payment. The Schedule Update Total Actual Cost to Date must match the Application for Payment WORK Completed and Stored to Date amount. The DISTRICT will advise the CONTRACTOR of any change to the due dates.

#### 3.02 CHANGES:

- A. Within ten (10) days after a schedule problem is identified by either CONTRACTOR or DISTRICT, the CONTRACTOR shall submit a Construction Recovery Schedule that identifies the cause of the Change and any actions required by the CONTRACTOR to recover the schedule and complete the WORK within Contract Time. The CONTRACTOR shall promptly undertake appropriate action, at no additional cost to the DISTRICT, to recover the schedule whenever the current schedule shows that the CONTRACTOR did not or cannot achieve a milestone established in the Contract.
- B. Appropriate recovery actions include, but are not limited to, assignment of additional labor, subcontractors, equipment, shift or overtime work, expediting of submittal or deliveries, or any combination of thereof. Overlapping of activities or sequencing changes shall be deemed appropriate only if properly substantiated in the submittal. Recovery plans that are accepted by the DISTRICT that add, delete, or change activities, activity relationships, durations or constraints and cost or resource loading must be submitted as a Revision to the Baseline Schedule with zero Total Float in accordance with this specification. Once the revised baseline is accepted by the DISTRICT, the CONTRACTOR must prepare a Schedule Update of the Baseline Schedule with all actuals to date and submit it for acceptance.
- C. The CONTRACTOR's refusal, failure or neglect to take appropriate recovery action or to submit a written recovery statement shall constitute reasonable evidence that the CONTRACTOR is not prosecuting the WORK, or separable part, with the diligence that will ensure its completion within the Contract Time. Such lack of action shall constitute sufficient basis for the DISTRICT to recommend the withholding of some or all of any payment due and/or shall be considered grounds for termination of the Contract by the DISTRICT.

END OF SECTION

## SECTION 01320 CONSTRUCTION VIDEO AND PHOTOGRAPHS

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: This SECTION specifies administrative and procedural requirements for construction photographs.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01300 - Submittals

#### 1.02 SUBMITTALS:

- A. Submit photographs electronically as specified in SECTION 01300 and in PART 3, this SECTION.

#### 1.03 QUALITY ASSURANCE:

- A. Photographs and video shall be clear and sufficient to show significant detail, not blurred, or taken in shadow, nor too distant. The DISTRICT may require that the photographs or video be retaken should the quality be insufficient. Costs for such re-takes are the CONTRACTOR's responsibility at no extra cost to the DISTRICT.

### PART 2 - PRODUCTS

#### 2.01 PHOTOGRAPHIC REQUIREMENTS:

- A. Specified in PART 3, this SECTION.

### PART 3 - EXECUTION

#### 3.01 COLOR AUDIO VIDEO TAPING OF CONSTRUCTION AREA:

- A. Prior to beginning any construction, the CONTRACTOR shall prepare a digital color audio video recording of all the areas to be affected by construction
- B. The audio video recording shall be done within the two-week period prior to placement of materials or equipment on the construction area and furnished one week prior to the start of construction. The audio video recording shall be done with a DISTRICT Representative present.
- C. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).
- D. The audio video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of original live recordings and thus shall not be copies of other audio and video recordings. The audio track shall contain the narrative commentary.
- E. The rate of speed in the general direction of travel of the conveyance used during recording shall be controlled to provide a usable image. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that playback will produce clarity of the object viewed.
- F. All recording shall be done during times of good visibility. No recording shall be done during periods of visible precipitation, unless otherwise authorized by the DISTRICT.



- G. The DISTRICT shall have the authority to designate what areas may be omitted or added for audio video coverage. Audio video coverage is not intended to be comprehensive and is primarily aimed at documenting conditions outside the designated earthwork area that could conceivably be inadvertently damaged or altered by CONTRACTOR.
- H. When conventional wheeled vehicles are used, the distance from the camera lens to the ground shall not be less than eight feet to insure perspective.
- I. In some instances, audio video coverage will be required in areas not accessible by conventional wheeled vehicles. Such coverage shall be obtained by walking.
- J. Areas covered shall include offsite roadways that will be subjected to heavy usage such as for haul routes or delivery of heavy components or equipment. CONTRACTOR shall include all laydown areas, access roads, gates, fences, and project drainage boundaries.

### 3.02 AERIAL PHOTOGRAPHY

- A. The Contractor shall engage the services of a professional aerial photography company to photograph project phases of construction: pre-, during, and post-construction. The first set of aerial photos shall be taken prior to the commencement of construction activity. Photo orientations shall be discussed and approved by the District Representative prior to taking of the photographs, with the intent of replicating the same orientation and altitude for the series of successive photographs.
  - 1. Four (4) aerial photos will be taken prior to commencing work, but not by more than 45 days. These photos include: 1) one vertical aerial of the entire project area and five (5) of project sections. Image orientation shall be approved by the District Representative.
  - 2. After initial pre-construction aerial photos, aerial photos will be taken monthly basis and only for the project area(s) actively under construction; for each project phase being photographed, the site will be photographed from two orientations (e.g., vertical and oblique).
  - 3. A last and full set of aerial photos (6 photos) shall be taken after completion and final acceptance of the project by the District.
- B. The District Representative shall have the authority to reject all or any portion of the aerial photography not conforming to specifications, and order that it be redone at no additional charge. The Contractor shall reschedule unacceptable coverage within 5 days after being notified. The District Representative shall designate those areas, if any, to be omitted from or added to the aerial photography coverage. All aerial photography becomes property of District.
- C. Project photographs shall be submitted in electronic formats. Print photographs shall be 8" X 10" color. Electronic versions of photographs will be provided electronically in ".jpg" format. Each photograph print shall have the project site, date and time the photograph was taken electronically superimposed on it or written in the bottom border or on the back of the photograph. Each submittal shall also include rights of reproduction for the District and the Engineer(s) of Record.
- D. The aerial photographs shall contain coverage of all surface features located within the construction's zone of influence. The surface features within the construction's zone of influence shall include, but not be limited to, all roadways, pavement, filter marsh, walls, railroad tracks, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, building,

landscaping, trees, shrubbery, and fences. Of particular concern shall be the existence or non-existence of any faults, fractures, or defects and private property lines and structures.

- E. All photographs shall be performed during times of good visibility. No photography shall be done during periods of significant precipitation, mist, or fog. The photography shall only be done when sufficient sunlight is present to properly illuminate the subject and to produce bright, sharp pictures of those subjects.

END OF SECTION

## SECTION 01410 TESTING AND QUALITY CONTROL

### PART 1 - GENERAL

1.01 CONTRACTOR QUALITY CONTROL: The CONTRACTOR shall provide and maintain an effective quality control program that fulfills the requirements of the Contract Documents.

- A. Establish a quality control system to perform sufficient inspection of all items of Work, including that of Subcontractors, to insure conformance to the Specifications and Drawings with respect to the materials, workmanship, construction, equipment performance, and identification.
- B. The CONTRACTOR's job supervisory staff may be used for quality control, supplemented as necessary by additional personnel for surveillance or special technicians to provide capability for the controls required by the Technical Specifications. The CONTRACTOR's quality control plan must clearly identify the quality control leader and personnel organizational system. The leader must have the authority to direct the removal and replacement of work.
- C. After the Contract is awarded and before construction begins, the CONTRACTOR shall meet with the DISTRICT or its representative to discuss quality control requirements. The meeting shall develop mutual understanding relative to details of the system, including the CONTRACTOR's forms to be used for recording the quality control operations, inspections, administration of the system, and the interrelationship of CONTRACTOR and DISTRICT inspection.
- D. All compliance inspections shall be recorded on appropriate forms, including but not limited to the specific items required in each section of the Technical Specifications. Those forms, including record of corrective actions taken, shall be furnished to the DISTRICT. The DISTRICT's quality control representative shall maintain a check off list of all deficiencies which are not corrected the same day as they are discovered.
- E. Should recurring deficiencies in an item or items indicate that the quality control system is not adequate, the CONTRACTOR shall take such corrective actions as may be required to comply with the Contract Documents.
- F. CONTRACTOR shall submit his written quality control plan for review, describing the activities and listing those inspection and testing activities that the CONTRACTOR will perform prior to beginning the Work. The CONTRACTOR's Quality Control Plan shall describe how he will communicate timely notification to allow for test and inspection activities performed by the DISTRICT, or its representatives, for on and off-site construction activities.

1.02 TESTING LABORATORY SERVICES: All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to DISTRICT. The laboratory shall be staffed with experienced technicians, properly equipped, ACI certified, and fully qualified to perform the tests in accordance with the specified standards.

1.03 TESTING LABORATORY SERVICES FURNISHED BY CONTRACTOR: All testing laboratory services in connection with tests (which are identified as the CONTRACTOR's responsibility in the Contract Documents) shall be performed and paid for by the CONTRACTOR, and a certified copy of the results will be furnished to the DISTRICT within 5 days of the test.

The CONTRACTOR is also responsible for testing and inspection services required to achieve an effective quality control program, to assure that the work strictly complies with the contract requirements. CONTRACTOR shall pay all costs for such services. CONTRACTOR shall also pay for any tests performed by DISTRICT which do not meet Specifications, as described below.

1.04 TESTING LABORATORY SERVICES FURNISHED BY DISTRICT:

- A. The DISTRICT may secure the services of a materials testing company, for field and laboratory tests, for certain items of work for quality assurance for items purported to be ready, which fail to meet Specification requirements.
  - 1. DISTRICT shall be reimbursed by CONTRACTOR for the cost of any tests or inspections, or tests on an item purported to be ready, which fail to meet Specification requirements. DISTRICT may withhold such amounts from payments otherwise due CONTRACTOR.
- B. Arrangements for delivery of samples and test specimens to the testing laboratory under this paragraph will be made by the DISTRICT. The testing laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and shall furnish a written report of each test.
- C. CONTRACTOR shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the Work when necessary.
- D. When sampling or testing activities are performed in the field by testing laboratory personnel, CONTRACTOR shall furnish personnel and facilities to assist in the activities.

1.05 TRANSMITTAL OF TEST REPORTS:

- A. Written reports of test and engineering data furnished by CONTRACTOR shall be submitted as specified in SECTION 01300.

END OF SECTION

## SECTION 01510 TEMPORARY UTILITIES AND FACILITIES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This SECTION includes requirements of a temporary nature not normally incorporated into final WORK. It includes the following:
  - 1. Utility services
  - 2. Construction and support facilities
  - 3. Construction aids
  - 4. Fire protection
  - 5. Bypass flow
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 01530 – Temporary Barriers and Controls
  - 3. SECTION 01590 – Field Offices and Sheds
  - 4. SECTION 02401 – Dewatering and Cofferdam
  - 5. SECTION 02402 – Bypass

#### 1.02 APPLICABLE STANDARDS AND PUBLICATIONS:

- A. Standards or Codes: The edition of the publications of the organizations listed below in effect at the time of the advertisement for bids form a part of this specification to the extent referenced. See the various paragraphs for the specified standard. In the case of a conflict between the requirements of this SECTION and those of the listed document, the requirements of this SECTION shall prevail.
  - 1. American National Standards Association (ANSI):
    - a. A10 Series - Safety Requirements for Construction and Demolition
    - b. ANSI/ASME PTC 19.1-1998 Test Uncertainty, Instrument and Apparatus
  - 2. National Electrical Contractors Association (NECA):
    - a. Electrical Design Library - Temporary Electrical Facilities
  - 3. National Fire Protection Association (NFPA):
    - a. NFPA 10 - Portable Fire Extinguishers
    - b. NFPA 70 - National Electrical Code
    - c. NFPA 241 - Safeguarding Construction, Alterations, and Demolition Operations
  - 4. National Electrical Manufacturers Association (NEMA)
  - 5. Underwriters Laboratories (UL)
  - 6. Florida Department of Transportation Standard Specifications for Road and Bridge Construction
  - 7. Florida Trench Safety Act (90-96, Laws of Florida)

#### 1.03 SUBMITTALS:

- A. Submit in accordance with SECTION 01300.
- B. Site Plan: Submit to the DISTRICT a Site Plan indicating CONTRACTOR's facilities including:
  - 1. Trailers
  - 2. Equipment Yard
  - 3. Parking
  - 4. Traffic Control
  - 5. Bypass flow

1.04 QUALITY ASSURANCE:

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements
  - 2. Utility company regulations
  - 3. Police, Fire Department, and rescue squad rules
  - 4. Environmental protection regulations
- B. Standards:
  - 1. Comply with NFPA 10 and 241, and ANSI A10 Series standards "Temporary Electrical Facilities."
  - 2. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

**PART 2 - PRODUCTS**

2.01 MATERIALS AND EQUIPMENT:

- A. Provide new materials and equipment. If acceptable to the DISTRICT, undamaged previously used materials and equipment in serviceable condition may be used. Provide materials and equipment suitable for the use intended, of capacity for required usage, and meeting applicable codes and standards. Comply with requirements of DIVISIONS 2 through 16.
- B. Water: Provide potable water approved by local health authorities.
- C. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- D. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- E. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

- F. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- G. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- H. Bypass Flows System: The CONTRACTOR shall provide bypass flow system as specified in SECTION 02402.

### **PART 3 - EXECUTION**

#### **3.01 TEMPORARY UTILITIES:**

- A. General:
  - 1. Engage the appropriate local utility company to extend temporary electric and phone service to the Project area from nearby existing utilities. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
  - 2. Provide adequate utility capacity at each stage of construction. Prior to availability of temporary utilities at the Site, or in remote areas without services, provide trucked-in services as required for start-up and construction operations.
  - 3. Furnish, install and maintain temporary utilities required for adequate construction, safety and security. Modify, relocate and extend systems as WORK progresses. Repair damage caused by installation or use of temporary facilities. Grade the areas of Site affected by temporary installations to required elevations and grades, and clean the area. Remove on completion of WORK or until service or facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
  - 4. The types of temporary construction utilities and facilities required include, but are not limited to, potable drinking water, wastewater, drainage, dewatering equipment, enclosure of WORK, ventilation, electrical power, lighting, hoisting facilities, stairs, ladders, and roads.
  - 5. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications and permits for use.
  - 6. Materials used for temporary service shall not be used in the permanent system unless so specified or acceptable to the DISTRICT.

#### **3.02 TEMPORARY ELECTRICITY AND LIGHTING:**

- A. New Service:
  - 1. Arrange with utility company to extend existing electric service to temporary office trailers.
  - 2. Connect temporary service in a manner directed by utility company officials. Provide separate meter for metering of power used by all entities authorized to be at or perform WORK at the Project Site.
  - 3. The electric service shall be of sufficient capacity and characteristics for the various construction tools, machinery, lights, heating and air conditioning, pumps, and other tools required by CONTRACTOR and his Subcontractors. In areas of the Project where permanent or temporary

power service from the local utility is not available, the CONTRACTOR shall supply and maintain engine-driven, power-generator sets.

4. Provide weatherproof, grounded, power distribution system sufficient to accommodate construction operations requiring power, use of power tools, electrical heating and lighting. Provide overload protection. Supply power for electric welding, if any, from engine-driven, power-generator sets.
  5. Provide adequate artificial lighting for all areas of WORK when natural light is not adequate for WORK.
  6. Sufficient light shall be provided for general construction areas, with additional sufficient lighting for specific tasks and to meet safety requirements.
- B. Use of Permanent System:
1. Prior to use of permanent system to be installed by the power company for construction purposes, obtain written permission of the DISTRICT.
  2. Maintain permanent system as specified for temporary facilities.
- C. Costs of Installation and Operation:
1. Pay fees and charges for permits and applications.
  2. Pay costs of installation, maintenance, removal of temporary services, and restoration of any permanent facilities used.
  3. Pay costs of electrical power used (if applicable).
  4. Pay costs of furnishing, operating, and maintaining engine-driven power-generator sets, where applicable.

### 3.03 TEMPORARY HEAT AND VENTILATION:

- A. General:
1. Provide temporary heat, ventilation and cooling as required to maintain adequate environmental conditions in temporary office trailers and storage sheds and to facilitate progress of the WORK, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage. Protect from adverse effects of low temperatures or high humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
  2. Methods of heating and fuel shall be suitable for particular purposes. Portable heaters shall be standard approved units with controls.
- B. Costs of Installation and Operation:
1. Pay fees and charges for applications, permits, and inspections.
  2. Pay costs of installation, operation, maintenance, removal of equipment, and restoration of existing or permanent facilities if used.
  3. Pay cost of power and fuel used.

### 3.04 TEMPORARY TELEPHONE SERVICE: NOT USED

### 3.05 TEMPORARY SANITARY FACILITIES:

- A. CONTRACTOR-Furnished Facilities:
1. Furnish, install and maintain temporary sanitary facilities for use through construction period. Remove on completion of WORK.



2. Provide for all construction workers under this Contract and representatives at the Site.
3. Toilet facilities shall be of the chemical-aerated recirculation or combustion type, properly vented and fully enclosed with a glass- fiber-reinforced polyester shell or similar nonabsorbent material.

3.06 TEMPORARY CONSTRUCTION AIDS:

A. General:

1. Provide construction aids and equipment required by personnel, available for DISTRICT observers' use, and to facilitate the execution of the WORK; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
2. Materials may be new or used, must be suitable for the intended purpose and meet the requirements of applicable codes, regulations and standards.
3. When platform stair framing is in place, provide temporary treads, platforms, and railings for use by construction personnel.

3.07 TEMPORARY BYPASS FLOW:

- A. The CONTRACTOR shall furnish a bypass system as specified in specification SECTION 02402.

3.08 INSTALLATION AND REMOVAL:

- A. Relocation: Relocate construction aids as required by progress of construction, by storage or WORK requirements, and to accommodate requirements of DISTRICT and other CONTRACTORS at the Site.
- B. Removal: Remove temporary materials, equipment and services when construction needs can be met and allowed by use of permanent construction, or at completion of the Project.
- C. Repair: Clean and repair damage caused by installation or by use of temporary facilities.
1. Remove foundations and underground installations for construction aids.
  2. Grade the areas of the Site affected by temporary installations to required elevations and clean the area.

END OF SECTION

## SECTION 01530 TEMPORARY BARRIERS AND CONTROLS

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes General Requirements for:
  - 1. Protection of Work
  - 2. Protection of existing property
  - 3. Barriers
  - 4. Security
  - 5. Environmental controls
  - 6. Access roads and parking areas
  - 7. Traffic control and use of roadways
- B. Related Work Specified Elsewhere:
  - 1. SECTION 02435 Turbidity Control and Monitoring

#### 1.02 REFERENCES:

- A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction (FDOT)

### PART 2 - PRODUCTS (Not Applicable)

### PART 3 - EXECUTION

#### 3.01 SAFETY AND PROTECTION OF WORK AND PROPERTY:

- A. General:
  - 1. Provide for the protection of the Work as set forth in the Contract Documents. Provide protection at all times against rain, wind, storms, frost, freezing, condensation, or heat so as to maintain all Work and Equipment and Materials free from injury or damage. At the end of each day all new Work likely to be damaged shall be appropriately protected.
  - 2. Notify DISTRICT immediately at any time operations are stopped due to conditions which make it impossible to continue operations or to obtain proper results.
  - 3. Construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations, pits, and trenches dewatered sufficiently to permit continuous construction.
  - 4. Protect floors from damage by proper covering and care when handling heavy equipment, painting, or handling mortar or other such materials. Use proper cribbing and shoring to prevent overloading of floors while moving heavy equipment. Provide metal pans under pipe-threading machines and other machines that may leak oil and clean such pans daily, keeping oil off floors. Restore floors to former condition where damaged or stained.
  - 5. Concrete floors less than 28-days old shall not be loaded without written permission from DISTRICT.
  - 6. Restrict access to roofs except as required by the Work. Where access is required, provide protection with plywood, boards, or other suitable materials.

B. Property Other than DISTRICT's:

1. Provide for the protection of property as set forth in the Contract Documents. Report immediately to the owners thereof and promptly repair damage to existing facilities resulting from construction operations.
2. Names and telephone numbers of representatives of the power company having jurisdiction over power lines in the Work area can be obtained from the DISTRICT. CONTRACTOR shall contact the power company a minimum of 7 calendar days prior to performing Work within 500' of power transmission line property, right-of-way or easement lines.
3. The applicable requirements specified for protection of the Work shall also apply to the protection of existing property of others.
4. Restore all property affected by CONTRACTOR's operations to the original or better condition.

3.02 BARRIERS:

A. General:

1. Furnish, install, and maintain suitable barriers as required to prevent public entry, protect the public, and to protect the Work, existing facilities, trees, and plants from construction operations. Remove when no longer needed or at completion of Work.
2. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards or regulatory agencies.
3. Barriers shall be of a neat and reasonable uniform appearance, structurally adequate for the required purposes.
4. Maintain barriers in good repair and clean condition for adequate visibility.
5. Relocate barriers as required by progress of Work.
6. Repair damage caused by installation and restore area to original or better condition. Clean the area.

3.03 ENVIRONMENTAL CONTROLS:

A. Dust Control:

1. If appropriate to the site location, and at the discretion of the DISTRICT, provide positive methods and apply dust control materials to minimize raising dust from construction operations.
2. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
3. Schedule operations so that dust and other contaminants will not fall on wet or newly-coated surfaces.
4. Cover materials transported to and from site as necessary to prevent depositing material on offsite roadways or creating dust.

B. Water and Erosion Control:

1. Provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties as specified in SECTION 02435. Coordinate with on-site farming operations.
2. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
  - a. Hold the areas of bare soil exposed at one time to a minimum.
  - b. Provide temporary control measures such as berms, dikes, and drains.

3. Control fill, grading, and ditching to direct surface drainage away from excavations and other construction areas, and to direct drainage to proper runoff.
  4. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and ground water.
  5. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.
- C. Debris Control and Clean-Up:
1. Keep the premises free at all times from accumulations of debris, waste materials, and rubbish caused by construction operations and employees. Responsibilities shall include:
    - a. Adequate trash receptacles about the site, emptied promptly when filled.
    - b. Periodic cleanup to avoid hazards or interference with operations at the site and to maintain the site in a reasonably neat condition.
    - c. The keeping of construction materials such as forms and scaffolding neatly stacked.
    - d. Immediate cleanup to protect the Work by removing splattered concrete, oil, paint, corrosive liquids, and cleaning solutions from walls, floors, and metal surfaces before surfaces are marred.
  2. Prohibit overloading of trucks to prevent spillages on access and haul routes. Provide periodic inspection of traffic areas to enforce requirements.
  3. Final cleanup is specified in SECTION 01700 Contract Closeout.
- D. Pollution Control:
1. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of hazardous or toxic substances from construction operations.
  2. Provide equipment and personnel and perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-site in approved locations, and replace with suitable compacted fill and topsoil.
  3. Take special measures to prevent harmful substances from entering public waters, sanitary, or storm sewers.
  4. If hazardous materials are discharged, report to authorities as required by Law or Regulations and notify DISTRICT.

### 3.04 TRAFFIC CONTROL AND USE OF ROADWAYS:

- A. Traffic Control:
1. Provide, operate, and maintain equipment, services, and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow on haul routes, at site entrances, on-site access roads, and parking areas. This includes barricades and other devices or personnel as necessary to adequately protect the public. Prepare and submit Traffic Control Plan to DISTRICT for acceptance.
  2. Remove temporary equipment and facilities when no longer required. Restore grounds to original, better, or specified conditions.
  3. Provide and maintain suitable detours or other temporary expedients if necessary.
  4. Bridge over open trenches where necessary to maintain traffic.
  5. Consult with governing authorities to establish public thoroughfares which will be used for site access. All operations shall meet the approval of owners or agencies having jurisdiction.

B. Maintenance of Roadways:

1. Repair off-site roads, water control and DISTRICT levees damaged by operations. Keep traffic areas as free as possible of excavated materials and maintain in a manner to eliminate dust, mud, and hazardous conditions.
2. All operations and repairs shall meet the approval of owners or agencies having jurisdiction.

3.05 SECURITY:

- A. The CONTRACTOR is solely responsible for initiating and maintaining security at the construction site. CONTRACTOR shall take all necessary precautions for the security of, and shall provide the necessary protection to:
1. Materials and equipment incorporated into the work, or stored on-site prior to incorporation into the work.
  2. Temporary field offices and sheds, and their contents including those listed in SECTION 01590.
  3. Plant and equipment including any equipment furnished for use by the DISTRICT.
- B. The CONTRACTOR shall replace, in kind, any materials or equipment lost, damaged or destroyed at its own expense.

END OF SECTION

## SECTION 01590 FIELD OFFICES AND SHEDS

### PART 1 - GENERAL

1.01 SUMMARY: This section includes requirements for temporary field offices and other structures for office and storage space required by CONTRACTOR and the DISTRICT.

A. Related Work:

1. SECTION 01510 Temporary Utilities and Facilities

B. Use of Existing Facilities: Existing facilities at the site shall not be used for field offices.

C. Use of Permanent Facilities: Permanent facilities when substantially completed shall not be used for field offices or for storage.

### PART 2 - PRODUCTS

2.01 FIELD OFFICES:

A. General:

1. CONTRACTOR may provide a field office for CONTRACTOR's superintendent on the site.

2.02 STORAGE SHEDS AND TRAILERS:

A. On-Site:

1. Provide temporary buildings or trailers needed for storage of Equipment and Materials installed under this Contract (and those furnished by DISTRICT or others under separate Contract).
2. Provide ventilation and heating as required by Equipment and Material stored.

B. Off-Site:

1. Advise the DISTRICT of any arrangements made for storage of Equipment and Materials in a place other than DISTRICT's site. Furnish evidence of insurance coverage with Application for Payment in conformance with the General Terms & Conditions.

### PART 3 - EXECUTION

3.01 LOCATION, INSTALLATION AND MAINTENANCE:

A. General:

1. Place temporary buildings, trailers and stored materials in locations acceptable to DISTRICT.
2. Installed field offices and sheds to resist winds and elements of the locality where installed.
3. Remove when no longer needed at the site or when Work is completed.
4. Keep approach walks free of leaves, mud, water, or ice.
5. At completion of Work, remove temporary buildings and trailers, foundations (if any), utility services, and debris.
6. Prepare ground or paved areas as specified in applicable Sections.

END OF SECTION

## SECTION 01700 CONTRACT CLOSEOUT

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: This SECTION includes administrative and procedural requirements for Contract Closeout including, but not limited to, the following:
  - a. Inspection procedures
  - b. Project record document submittal
  - c. Operation and maintenance manual submittal
  - d. Submittal of warranties
  - e. Final cleaning
  - f. CONTRACTOR's Certification
- B. Closeout requirements for specific construction activities are included in the appropriate SECTIONS.
- C. Related Work Specified Elsewhere:
  - 1. SECTION 01300 - Submittals
  - 2. SECTION 01530 – Temporary Barriers and Controls

#### 1.02 SUBSTANTIAL COMPLETION:

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, the CONTRACTOR shall satisfy the following:
  - 1. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents. Submit in accordance with SECTION 01300.
  - 2. Obtain and submit releases enabling the DISTRICT unrestricted use of the WORK and access to services and utilities. Include Certificates of Occupancy (C.O.), operating certificates, and similar releases, as required.
  - 3. Submit Record Documents, maintenance manuals, Project photographs, damage or settlement surveys, property surveys, and similar record information as specified in Paragraph 1.04. All drawings shall be scanned and submitted in accordance with SECTION 01300, and in hard copy form, 24 inch by 36 inch plan size. All other documents shall also be scanned and submitted in accordance with SECTION 01300.
  - 4. The CONTRACTOR shall provide one (1) set of As-Built Drawings depicting all elevations in NAVD 88.
  - 5. Provide as-built surveys of all cross-sections depicted in the plans certified by a Professional Land Surveyor registered in the State of Florida. This includes verifying proper embankment slopes and removal of excess material.
  - 6. Complete final cleanup requirements, including touch up painting.
  - 7. Touch up and otherwise repair and restore marred, exposed finishes.
- B. Inspection Procedures: On receipt of a request for inspection, the DISTRICT will either proceed with inspection or advise the CONTRACTOR of unfilled requirements. The DISTRICT will prepare the Certificate of Substantial Completion following inspection or advise the CONTRACTOR of WORK that must be completed or corrected before the certificate will be issued.
  - 1. The DISTRICT will reschedule the inspection when in its opinion, the WORK is substantially complete.

#### 1.03 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Submit certification by CONTRACTOR that WORK has been completed in accordance with the Contract Documents to the knowledge of the CONTRACTOR. Before requesting final inspection, complete the following:
  - 1. Submit the final payment request with releases and supporting documentation. Include insurance certificates for products and completed operations where required.
  - 2. Submit a certified copy of the DISTRICT's final inspection list of items to be completed or corrected. The certified copy of the list shall state that each item has been completed.
  - 3. Submit consent of surety to final payment.
  - 4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 5. Submit Release of Liens (from the Prime, and all Subcontractors, Vendors and Suppliers).
  - 6. Submit Maintenance Bond (if applicable).
  - 7. The above shall be submitted in accordance with SECTION 01300.
- B. Reinspection Procedure: The DISTRICT will reinspect the WORK upon receipt of notice that the WORK, including inspection list items from earlier inspections, has been completed.
  - 1. Upon completion of reinspection, the DISTRICT will advise the CONTRACTOR of WORK that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
  - 2. If necessary, reinspection will be repeated.
- C. Return all keys furnished by the DISTRICT. The CONTRACTOR shall forfeit his key deposit for keys that are not returned.

1.04 RECORD DOCUMENT SUBMITTALS:

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the DISTRICT's reference during normal working hours.
- B. As-Built Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Drawings and Shop Drawings. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set. Mark the set to show the actual installation where the installation varies substantially from the WORK as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Call attention to each entry by drawing a "cloud" around the areas affected.
- C. The DISTRICT will make electronic copies of whatever electronic versions of the Drawings exist, available to the CONTRACTOR for As-Built purposes. The CONTRACTOR must obtain concurrence of the DISTRICT as to form and content of record information provided in electronic format prior to proceeding, but in general, information similar to that shown below needs to be similarly provided.
  - 1. Record information concurrently with construction progress.
  - 2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the WORK. Mark each document "AS-BUILT DRAWINGS" in neat, large, printed letters.
  - 3. Mark as-built invert elevations for all water control structures, culverts, etc. Refer to SECTION 01050 for structures which require a permanent benchmark.
  - 4. Mark new information that is important to the DISTRICT that is not shown on Drawings or Shop Drawings.
  - 5. Note related change-order numbers where applicable.
  - 6. Include the following:



- a. Where Submittals (like Shop Drawings) are used for mark-up, record a cross-reference at corresponding location on Drawings.
- b. Field changes of dimension and detail.
- c. Changes made by Change Order or other Modifications.
- d. Details not on original Contract Drawings.
- e. As-Built shall include a plot of the actual excavation cross-sections plotted at the same station as and on top of the design cross-sections.
- f. As-Built shall include a plot of the actual levee and embankment cross-sections plotted at the same station as and on top of the design cross-sections.
- g. Give particular attention to concealed elements that would be difficult or expensive to locate at a later date.
- h. GPS (global positioning system) coordinates of major structures using the format lat/long DD (decimal/degree) NAD83 (North American Datum).
- 7. Record Specifications: Maintain one (1) complete copy of the Contract Documents including addenda. Include with the Contract Documents one (1) copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
- 8. Mark these documents to show substantial variations in actual WORK performed in comparison with the text of the Specifications and modifications.
- 9. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
- 10. Note related As-Built information and Product Data.
- 11. Upon completion of the WORK, submit record Specifications to the DISTRICT for the DISTRICT's records on CD in PDF format.
- 12. Include the following:
  - a. MANUFACTURER, trade name, catalog number, and Supplier of each product and item of equipment actually installed, including optional and substitute items
  - b. Changes made by Addendum, Change Order, or other Modifications
  - c. Related Submittals
- 13. Affix the CONTRACTOR's corporate seal on the cover sheet indicating the documents within are representative of the as-built condition of the Project. The seal shall be signed by an officer of the company.
- D. Record Product Data: Provide one (1) copy of each Product Data submittal. Note related Change Orders and markup of Record Documents.
  - 1. Mark these documents to show significant variations in actual WORK performed in comparison with information submitted. Include variations in products delivered to the Site and from the MANUFACTURER's installation instructions and recommendations.
  - 2. Give particular attention to concealed products and portions of the WORK that cannot otherwise be readily discerned later by direct observation.
- E. Record Sample Submitted: Immediately prior to Substantial Completion, the CONTRACTOR shall meet with the DISTRICT's personnel at the Project Site to determine which Samples are to be transmitted to the DISTRICT for record purposes. Comply with the DISTRICT's instructions regarding packaging, identification, and delivery to the DISTRICT.
- F. Miscellaneous Record Submittals: Refer to other Specification SECTIONS for requirements of miscellaneous record keeping and submittals in connection with actual performance of the WORK. Immediately prior to the date or dates of Substantial Completion (unless otherwise specified), complete miscellaneous records and place in good order. Identify miscellaneous records properly, bind or file, and submit to the DISTRICT for the DISTRICT's records.

- G. Warranties and Bonds: Submit original documents as specified in the General Conditions, Supplemental Conditions, SECTION 01300, and technical specifications.

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

### **3.01 FINAL CLEANING:**

- A. General: The contract documents require general cleaning during construction. Regular Site cleaning is included in SECTION 01530.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with MANUFACTURER's instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
    - a. Clean the Site of rubbish, litter, and other foreign substances. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
    - b. Remove temporary structures, tools, equipment, supplies, and surplus materials.
    - c. Remove temporary protection devices and facilities which were installed to protect previously completed WORK.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the WORK during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the DISTRICT's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Site and dispose of lawfully.
1. Where extra materials of value remain after completion of associated WORK, they become the DISTRICT's property. Dispose of these materials of no value to the DISTRICT as directed by the DISTRICT.
- E. Repairs:
1. Repair damaged protective coated surfaces.
  2. Repair roads and other items damaged or deteriorated because of construction operations, including those which have been damaged, but are not located within the Project limits.
  3. Restore all ground areas affected by construction operations.

END OF SECTION

SECTION 02050      DEMOLITION

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall include the removal of existing construction to limits indicated on drawings where earthwork or other construction operations are to be performed as specified herein. The DISTRICT shall not be responsible for the condition of any items to be removed or salvaged.
- B. The specification sections listed below may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 02110 – Clearing and Land Preparation
  - 3. SECTION 02435 - Turbidity Control and Monitoring
  - 4. SECTION 02436 - Environmental Protection
  - 5. SECTION 02370 – Rip Rap System

1.02 APPLICABLE PUBLICATIONS: (Not Used)

1.03 DEFINITIONS: (Not Used)

1.04 SUBMITTALS:

- A. Schedule of Demolition:
  - 1. Submit proposed methods and operations of demolition for review and approval by the DISTRICT prior to the start of WORK.
- B. Permits:
  - 1. The CONTRACTOR shall be responsible for acquiring appropriate necessary permits for the work. Copies of the permits shall be submitted to the DISTRICT prior to commencement of demolition.

1.05 QUALIFICATIONS: (Not Used)

1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall not commence demolition of structure(s) prior to written permission of the DISTRICT.
- B. Condition of structures to be demolished:
  - 1. The DISTRICT assumes no responsibility for actual condition of structures to be demolished.
  - 2. Conditions existing at time of inspection for bidding purposes will be maintained by DISTRICT insofar as practicable.
- C. The CONTRACTOR shall remove all such foundations to one foot below the proposed sub-grades.
- D. Explosives: The use of explosives will not be permitted. The CONTRACTOR may use a non-explosive, expanding agent in drilled holes for the demolition of concrete, and shall conform to all manufacturers' recommendations, including safety precautions for mixing and placing the agent.

- E. The CONTRACTOR shall ensure the safe passage of persons around the area of demolition and clearing. The CONTRACTOR shall conduct operations to prevent injury to adjacent structures, other facilities, and any persons.
  - 1. The CONTRACTOR shall protect existing finish work that is to remain in place from damage due to demolition operations.
- F. Traffic:
  - 1. The CONTRACTOR shall conduct operations and the removal of debris to ensure minimum interference with existing access roads and other adjacent, occupied or used facilities in coordination with Hillsborough County.
  - 2. Do not close, block or otherwise obstruct access roads or other occupied or used facilities without permission from the DISTRICT.
- G. The CONTRACTOR shall promptly repair damages caused to adjacent facilities by demolition operations at no cost to the DISTRICT.
- H. Utilities Disconnection:
  - 1. The CONTRACTOR shall perform all necessary coordination to locate, disconnect, relocate, and/or protect as needed all existing underground, aboveground, and overhead utilities within the limits of demolition prior to commencement of demolition operations. All expenses incurred for the coordination with utility companies and agencies, shall be at no cost to the DISTRICT.
  - 2. The CONTRACTOR shall promptly repair damages to existing utilities that are to remain, at no cost to the DISTRICT.

1.07 CERTIFICATIONS AND TESTING: (Not Used)

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 hours advance notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Used)

## **PART 2 - PRODUCTS**

## **PART 3 - EXECUTION**

### **3.01 DEMOLITION:**

- A. The CONTRACTOR shall provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
- B. If hazardous materials are found, the CONTRACTOR shall notify the DISTRICT immediately.
- C. The CONTRACTOR shall completely backfill below-grade areas and voids resulting from demolition work. The CONTRACTOR shall provide fill consisting of approved soil, gravel or sand (free of trash and debris) and compact fill to approximate density of surrounding native soil.

### **3.02 DISPOSAL OF DEMOLISHED MATERIALS:**

- A. The CONTRACTOR shall remove debris, rubbish, and other materials resulting from demolition operations.

- B. If hazardous materials are encountered during demolition operations, the CONTRACTOR shall comply with all applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- C. The CONTRACTOR shall transport materials removed from demolished structures and properly dispose of them at an approved site according to the State, Federal, and local regulations.

3.03 CONNECTIONS TO EXISTING CONSTRUCTION:

- A. The CONTRACTOR shall cut and remove portions of existing construction as required to allow proper installation of new construction.
- B. The CONTRACTOR shall shore, brace and maintain existing structure(s) in a safe condition until permanent supports are completed.
- C. The CONTRACTOR shall repair all damage as a result of installation of shoring and bracing.

3.04 CLEANUP AND REPAIR:

- A. Upon completion of demolition work, the CONTRACTOR shall remove all tools, equipment, and demolished materials from site; see SECTION 1.01 and SECTION 3.02 of this specification.
- B. The CONTRACTOR shall repair demolition performed in excess of that required and return structures and surfaces to conditions existing prior to commencement of demolition work. The CONTRACTOR shall repair adjacent construction or surfaces soiled or damaged by demolition work to the satisfaction of the DISTRICT.
- C. The CONTRACTOR may burn combustible products of the demolition operation on site provided the written approval is obtained from the DISTRICT for burn locations and methods, including methods for preventing uncontrolled spread of the burn. The CONTRACTOR shall obtain the proper permits before DISTRICT'S final approval.
- D. The CONTRACTOR shall remove or modify as indicated all existing construction within the construction limits to the extent necessary to permit construction of the work. The CONTRACTOR shall properly dispose of the material at an approved site according to the State, Federal, and local regulations.

END OF SECTION

SECTION 02100 SITE PREPARATION

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, materials, and equipment necessary for complete and proper site preparation within the areas shown on the Drawings and specified herein and observe permit conditions.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 02050 – Demolition
  - 3. SECTION 02114 – Tree Removal
  - 4. SECTION 02200 – Earthwork
  - 5. SECTION 02436 – Environmental Protection Plan

1.02 APPLICABLE PUBLICATIONS:

- A. Applicable Standards:
  - 1. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition (FDOT)

1.03 DEFINITIONS: (Not Applicable)

1.04 SUBMITTALS: (Not Applicable)

1.05 QUALIFICATIONS: (Not Applicable)

1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall make all excavations for piping and appurtenant structures in any material encountered to the depth and grades required, shall backfill such excavations and dispose of excess or unsuitable materials from excavation, and shall provide and place necessary borrow material to properly backfill excavations, all as indicated on the drawings, specified herein, or as directed by the DISTRICT.
- B. Excavation, dewatering, sheeting and bracing required shall be carried out so as to prevent any possibility of undermining or disturbing the foundations of any existing structure or work, and so that all work may be accomplished and inspected in the dry, except as directed by the DISTRICT. Aqueous construction may be performed only with prior approval of the DISTRICT.

1.07 CERTIFICATIONS AND TESTINGS: (Not Applicable)

1.08 INSPECTION COORDINATION: (Not Applicable)

1.09 WARRANTY: (Not Applicable)

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

- 3.01 TRAFFIC CONTROL: The CONTRACTOR shall provide proper warning devices and barriers for protection of the public and workmen in accordance with FDOT Specification Section 102-3 Traffic Control and local regulations.
- 3.02 STANDARD CLEARING AND GRUBBING: Standard site clearing and grubbing, in accordance with FDOT Specification Section 110.2, shall be performed within the areas shown on the Drawings or otherwise noted in the above referenced specification.
- 3.03 EROSION CONTROL: The CONTRACTOR shall prevent and control erosion and water pollution as per FDOT Specification Sections 104-1, 2, 3, 4, 6 and 7 and Florida Department of Environmental Protection (FDEP) regulations and permit conditions.
- 3.04 PROTECTION AND/OR RELOCATION OF EXISTING FACILITIES: Existing facilities such as storm drains, roadways, water lines, light poles, conduits, fences, utility and telephone lines, etc. are to be carefully protected from damage during all phases of the construction. The CONTRACTOR shall make all necessary arrangements with the owner of the facility and be responsible for all costs involved in the proper protection, relocation or other work that such owners deem necessary.
- 3.05 UNDERGROUND UTILITIES: The CONTRACTOR shall provide all necessary liaisons with other utilities (underground) by notification, 48 hours in advance, of any digging by telephoning the appropriate Utility Notification Center and local utilities.

END OF SECTION

## SECTION 02110 CLEARING AND LAND PREPARATION

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall include the removal of trees and other vegetation from areas where earthwork or other construction operations specified herein are to be performed. This section also includes land preparation activities for excavation and fill areas.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 02050 – Demolition
  - 3. SECTION 02100 – Site Preparation
  - 4. SECTION 02114 – Tree Removal
  - 5. SECTION 02200 – Earthwork
  - 6. SECTION 02436 – Environmental Protection Plan

#### 1.02 APPLICABLE PUBLICATIONS:

- A. Florida Department of Transportation (FDOT)
  - 1. 104 – Specification Prevention, Control, and Abatement of Erosion and Water Pollution

#### 1.03 DEFINITIONS: (Not Applicable)

#### 1.04 SUBMITTALS:

- A. Prior to beginning the WORK, CONTRACTOR shall submit a detailed plan for clearing and land preparation in conformance with SECTION 01300. The plan shall detail the sequence of WORK and describe the CONTRACTOR's planned method of clearing and land preparation activities.

#### 1.05 QUALIFICATIONS: (Not Applicable)

#### 1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall ensure the safe passage of persons around areas of clearing and land preparation. The CONTRACTOR shall conduct its operations to prevent injury to adjacent structures, vegetation designated to remain, other facilities and persons.
- B. Traffic:
  - 1. The CONTRACTOR shall conduct its operations and the removal of cleared materials to ensure minimum interference with existing access roads and other adjacent occupied or used facilities.
  - 2. The CONTRACTOR shall not block or otherwise obstruct access roads or other occupied or used facilities without permission from the DISTRICT. Where blockage is allowed, the CONTRACTOR shall provide alternate routes around closed or obstructed traffic ways.
- C. The CONTRACTOR may commence clearing or land preparation within portions of the project falling within the limits of temporary construction easements or utility Right-of-Way only with specific permission from the DISTRICT for each activity and location. All requirements under A and B above apply within these limits.



1.07 CERTIFICATIONS AND TESTING: (Not Applicable)

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 advance hours notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Applicable)

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

3.01 GENERAL CLEARING:

- A. The CONTRACTOR shall remove the majority of the above grade non-native vegetative matter in the areas indicated on the plans. The CONTRACTOR shall complete the work of Clearing and Land Preparation as outlined below.
  - 1. Mowing or the use of a bush-hog may be required in areas of heavy grass, weeds, or woody-stalked vegetation.
  - 2. Completely remove all designated exotic/hazardous trees and shrubs within the designated earthwork boundaries. Segregate clusters of exotic trees and shrubs from native plants at locations to be designated by the DISTRICT in the field. CONTRACTOR may burn the exotics onsite in accordance with 3.01 C., or properly dispose of the exotic vegetation in an offsite disposal, energy, or mulching facility permitted to receive such materials.
  - 3. Remove any garbage, pipes, or other waste debris recovered during clearing.
  - 4. Remove all existing non-native slope revetment, i.e., riprap stone, concrete or rocks, and textiles, i.e., geotextile fabrics, designated for removal.
  - 5. On completion of the clearing, remove all sticks, rubbish and other extraneous material and rake the ground surface in order to leave a smooth and clean appearance.
  - 6. Clearing and land preparation shall proceed sufficiently ahead of earthwork activities to minimize disruption and allow time for determination of the adequacy of the clearing procedure.
  - 7. All tree removal and pruning shall be performed in accordance with approved principles of modern arboricultural methods.
  - 8. All trees to remain in the project area, as designated by the DISTRICT, shall be protected from damage by tree barricades.
  - 9. All WORK shall be performed without damage to existing amenities, including trees and shrubs. The CONTRACTOR shall be responsible for repair and replacement of existing amenities to the satisfaction of the DISTRICT. The CONTRACTOR shall protect all vegetation, habitats, or amenities on the project location as indicated on the plans and in accordance with SECTION 02436 Environmental Protection Plan.
- B. The CONTRACTOR shall clear adjacent to cut or fill sections to a minimum distance of ten (10) feet outside of slope lines unless lesser distances are specified. Clearing in areas of native vegetation for embankment construction shall be limited to a distance of 10 feet outside of slope lines.
- C. The CONTRACTOR may burn combustible products of the clearing operation on the site with the written approval of the DISTRICT and with permission of the local authorities. The CONTRACTOR shall comply with all local ordinances or regulations for burn locations and methods, including

- methods for preventing uncontrolled spread of the burn. The CONTRACTOR shall provide the DISTRICT with copies of permits prior to burning.
- D. The CONTRACTOR may not burn cleared materials within the limits of any utility Right-of-Way without written permission of the controlling agency. The CONTRACTOR will be required to collect and haul all cleared materials to an approved site for burning and disposal.
  - E. The CONTRACTOR shall haul all organic materials and residues left from burning operations to an approved landfill or disposal site.

3.02 CLEARING WITHIN AREAS OF NATIVE VEGETATION:

- A. The CONTRACTOR shall remove exotic trees/plants, hazardous material, trash, and debris and leave the site clean with a smoothly raked finish grade. Every reasonable effort shall be made to protect native vegetation designated to remain. Areas disturbed by work operations, such as, but not limited to, access points beyond the limits of the right-of way, shall be restored to original or better condition, including, but not limited to, filling, grading, sodding, and seeding/mulching as directed by the DISTRICT.

3.03 EROSION CONTROL:

- A. The CONTRACTOR shall prevent and control erosion and water pollution as per FDOT Specification Sections 104 -1, 2, 3, 4, 6 and 7 and Florida Department of Environmental Protection (FDEP) regulations and permit conditions.

END OF SECTION

## SECTION 02114 TREE REMOVAL

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, material, equipment and perform all work in strict accordance with the Specifications, Contract, and applicable requirements for the removal and disposal of trees and heavy brush on an as needed basis outside of the designated Construction Areas.
  - 1. SECTION 01300 - Submittals
  - 2. SECTION 02050 – Demolition
  - 3. SECTION 02100 – Site Preparation
  - 4. SECTION 02110 - Clearing and Land Preparation
  - 5. SECTION 02436 – Environmental Protection
- B. The CONTRACTOR shall accomplish the complete removal of designated trees, the disposal of resulting waste and debris, as well as any other rubbish, solid waste or debris existing and exposed during the execution of the WORK in those areas described. The CONTRACTOR shall perform the WORK in accordance with recognized and approved principles of modern arboricultural methods. The CONTRACTOR shall perform all WORK without damage to trees, shrubs, and/or facilities that are intended to remain in the work area.
- C. The DISTRICT will administer a pre-construction meeting to establish a working understanding between the parties specifically regarding environmental protection, and the removal and protection of designated trees.
- D. The CONTRACTOR shall perform the WORK which involves the following procedures:
  - 1. Pruning and removal of native vegetation to establish haul routes and walking paths from staging/laydown areas
  - 2. Preservation and protection of native vegetation
  - 3. Minimizing disturbance of forests and other facilities not involved in construction.
  - 4. Debris/rubbish/solid waste removal and disposal, site clean up, and finish grading to leave a clean and smoothly graded appearance.

#### 1.02 APPLICABLE PUBLICATIONS:

- A. American National Standards Institute (ANSI)
  - 1. (ANSI) Z133.1a: “Safety Requirements for Tree Care Operations - Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush”
  - 2. (ANSI) Z133.1: “Tree Care Operations - Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush”
  - 3. (ANSI) A300: “Tree Care Operations B Tree, Shrub and Other Woody Plant Maintenance”
- B. Florida Department of Agriculture & Consumer Services, Division of Forestry, “Tree Protection Manual for Builders and Developers”
- C. Florida Statute Chapter 487, “Florida Pesticide Laws”

- D. Occupational Safety and Health Regulations “29 CFR 1910,” Florida Statute 442 Occupational Safety and Health and other applicable federal, state and local regulations
- E. Florida Department of Transportation (FDOT)
  - 1. Index No. 544 – Landscape Installations
  - 2. Manual on Uniform Traffic Control Devices for Streets and Highways

1.03 DEFINITIONS: (Not Applicable)

1.04 SUBMITTALS:

- A. The CONTRACTOR shall submit as specified in SECTION 01300 the proposed methods and materials for clearing of invasive exotic plant material and trees, including a schedule indicating specific timeframes per sections/phases of the project and methods to protect trees to remain.
- B. The CONTRACTOR shall obtain all necessary permits to accomplish all of the WORK.
- C. The CONTRACTOR is responsible for performing all WORK in accordance with all applicable regulations, ordinances and code requirements from the appropriate city, county, state and/or federal jurisdiction the Project is located in.

1.05 QUALIFICATIONS: (Not Applicable)

1.06 RESPONSIBILITIES: (Not Applicable)

1.07 CERTIFICATIONS AND TESTING: (Not Applicable)

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 hours notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Applicable)

**PART 2 - PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION**

3.01 TREE REMOVAL:

- A. The CONTRACTOR shall accomplish the removal of trees and or all exotic plant material in a safe and acceptable manner by means of equipment designed for this purpose in conformance with ANSI Standards, A300, Z133.1 and Z133.1a. All other debris, trees and wood growth shall be removed. The CONTRACTOR shall accomplish the WORK of Tree Removal as outlined below.
- B. Remove approved vegetation from all areas outside of sensitive areas using mechanical equipment for clearing and grubbing. Sensitive areas are defined as areas dominated by native vegetation and areas to be preserved at existing grade and wetlands.
  - 1. Only handwork and hand tool work will be permitted within the sensitive areas. No mechanical equipment will be allowed within the sensitive areas. Existing native flora and fauna shall be protected from harm during the process. Treat exotic stumps with herbicide mixture approved by the DISTRICT. Herbicide shall be used in combination with flush cut tree stumps where necessary to protect native vegetation from damage by mechanical equipment.
  - 2. Where exotic trees are removed in sensitive areas, they shall be cut as low as possible (within 4 inches of surrounding natural grade).

3. In tree trimming, any cut of at least two (2) inches in diameter shall be cut flush to the main limb or trunk. All limbs shall be undercut to prevent bark teardown. All pruning shall be in conformance with ANSI A300 Pruning Standards.
4. In the event that the removal of exotic plant materials could damage any native trees or listed species, the CONTRACTOR shall notify the DISTRICT before proceeding further.

3.02 CLEARING AND BRUSH REMOVAL:

- A. The CONTRACTOR, where necessary or required, shall implement selective clearing methods conforming to the applicable requirements of ANSI Standards Z133.1, Z133.1a and A300.
- B. The CONTRACTOR may burn combustible products of the clearing operation on the site with the written approval of the DISTRICT and with permission of the local authorities. The CONTRACTOR shall comply with all local ordinances or regulations for burn locations and methods, including methods for preventing uncontrolled spread of the burn. The CONTRACTOR shall provide the DISTRICT with copies of permits prior to burning.
- C. The CONTRACTOR may not burn cleared materials within the limits of any utility Right-of-Way without written permission of the controlling agency. The CONTRACTOR will be required to collect and haul all cleared materials to an approved site for burning and disposal.

3.03 REMOVAL AND DISPOSAL:

- A. It shall be the CONTRACTOR's responsibility to remove and dispose of (in a legal manner) all mulch, cut branches, tree trunks and any other debris or solid waste at an approved disposal site. Limbs and any other debris/solid waste shall be disposed of by the CONTRACTOR and shall not be deposited into any trash container. Wood chips/mulch may be disposed of on DISTRICT property if directed by the DISTRICT.
- B. The CONTRACTOR shall perform all work in conformance with all applicable regulations, ordinances and code requirements of the appropriate city, county, state and/or federal jurisdiction. Exotic/invasive plants are defined as Brazilian Pepper, Australian Pine, Melaleuca, or as directed by the DISTRICT, and Contract Specifications.
- C. The CONTRACTOR shall haul all organic materials and residues left from burning operations to an approved landfill or disposal site.

3.04 TREE AND SHRUB PROTECTION:

- A. The CONTRACTOR shall exercise care to protect all trees and shrubs designated to remain. The CONTRACTOR shall install tree protection barricade in accordance with FDOT Index No. 544. Where trees and shrubs are adjacent to construction, they shall be protected - where damaged, restored or replaced to original conditions. Trees or existing grade damaged on the construction site shall be restored to original condition. Tree limbs, which interfere with equipment operation and are approved for pruning, shall be neatly trimmed in accordance with NAA/ANSI standards. The CONTRACTOR shall be responsible for damages, maintenance, and protection of trees and shrubs to be protected.

3.05 GRADES:

- A. It shall be the responsibility of the CONTRACTOR to provide the final grading to conform to surrounding grades and to be at the proper elevation with relation to walks, paving, drainage structures and other site conditions, unless indicated otherwise.

3.06 HERBICIDE TREATMENT:

- A. The CONTRACTOR shall provide herbicide for stump eradication as approved by the DISTRICT. Use of herbicides shall be in accordance with the MANUFACTURER's printed label instructions and

- applicable federal, state and local laws. Application of herbicides shall be by appropriately licensed personnel.
- B. The CONTRACTOR shall exercise extreme care to prevent damage to desirable existing growth as designated by the DISTRICT. If necessary, the CONTRACTOR shall conduct a test to establish suitability of product and applicator that will be used on this project prior to execution of the full application.

3.07 QUALITY ASSURANCE:

- A. The WORK Site shall be clean and free of trimmings, stumps, roots, logs, or any other debris resulting from the WORK, and trash, litter or rubbish exposed during the CONTRACTOR's tree removal services. Stumps and roots may remain in sensitive areas (as referenced in 3.01.B.1 of this SECTION) in accordance with the Contract Document.

3.08 EQUIPMENT:

- A. The CONTRACTOR shall provide equipment in good repair and operating condition at all times. Only equipment designed for performance of WORK described herein will be acceptable for operation. All equipment shall meet all safety requirements as established for this type of WORK. Equipment shall be operated and maintained in accordance with MANUFACTURER's recommendations. Equipment shall have the appropriate safety guards, which shall not be removed (e.g., chain saws, chippers, etc.).
- B. The CONTRACTOR will be required to have available on site and in good working condition a minimum of the following:
1. Sufficient traffic control devices to safely control traffic through WORK areas in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways" and Florida Department of Transportation requirements
  2. Three navigational buoys and advance warning signs, if applicable
- C. It shall be the responsibility of the CONTRACTOR to verify the location of all utilities, structures, etc., by hand excavation or other appropriate measures before performing any work that could result in damage or injury to persons, utilities, structures or property. The CONTRACTOR shall make a thorough search of the site for utilities, structures, etc., before work is commenced in any particular location.
- D. The CONTRACTOR shall not purposefully disrupt or disconnect any type of utility, electric or irrigation service without first obtaining the written permission of the DISTRICT. Requests for disconnection must be in writing and received by the DISTRICT at least seven calendar days prior to the time of the requested interruption.
- E. The CONTRACTOR shall take within two hours and complete within 48 hours the necessary steps to repair, replace, or restore all services to any utilities or other facilities, which are disrupted due to his or her operations.
- F. Should utilities, structures, etc., be encountered that interfere with the work and are not shown on the Drawings; the CONTRACTOR shall notify the DISTRICT immediately.

END OF SECTION

SECTION 02200 EARTHWORK

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, equipment, and materials for all excavating, trenching, filling, construction of embankment, backfilling, compacting, grading, and all related items of earthwork necessary to complete the WORK indicated or specified.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 01410 – Testing and Quality Control
  - 3. SECTION 02050 – Demolition
  - 4. SECTION 02110 – Clearing and Land Preparation
  - 5. SECTION 02215 – Protection of Existing Structures
  - 6. SECTION 02220 – Excavation and Backfilling
  - 7. SECTION 02221 – Trench Backfill and Compacting
  - 8. SECTION 02262 – Steel Sheet Piling
  - 9. SECTION 02370 – Riprap System
  - 10. SECTION 02401 – Dewatering and Cofferdam
  - 11. SECTION 02402 – Bypass
  - 12. SECTION 02436 – Environmental Protection
  - 13. SECTION 02486 – Grassing
  - 14. SECTION 02930 – Landscaping

1.02 APPLICABLE PUBLICATIONS:

- A. American Society of Testing Materials (ASTM):
  - 1. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using the Standard Effort (12,400 ft-lbf/ ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - 2. D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
  - 3. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using the Modified Effort (56,000 ft-lbf/ ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - 4. D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - 5. D2937 – Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
  - 6. D3740 – Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
  - 7. D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

8. D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
  9. D4564 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sleeve Method.
  10. D4914 – Standard Test Methods for Density and Unit Weight of Soil and Rock in Place by the Sand Replacement Method in a Test Pit.
  11. D5030 – Standard Test Method for Density of Soil and Rock in Place by the Water Replacement Method in a Test Pit.
  12. D6938 – Standard Test Method for In-place Density and Water Content of Soil and Soil-Aggregate by Nuclear Method Shallow Depth.
  13. E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
- B. Florida Department of Transportation (FDOT):
1. Standard Specifications for Road and Bridge Construction (latest edition).
- C. American Association of State Highway Transportation Officials (AASHTO):
1. AASHTO T 27 – Sieve Analysis of Fine and Course Aggregates.
  2. AASHTO T 99 - Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.
- D. Florida Method (FM) of Test:
1. FM T-1 011 – Florida Method of Test for Sampling Aggregates.
- E. Miscellaneous Project Data:
1. Subsurface soil data logs are provided for the CONTRACTOR’S reference. These are included in Arehna Engineering Inc. Project B-15-016 Report of Geotechnical Exploration – Thomas Tract Fish Farm (April 28 2015).

### 1.03 DEFINITIONS [if applicable]:

- A. Select Backfill: Select backfill shall be clean, well-graded material free from debris, peat, roots, organic material, clods, and stones with a diameter greater than 3 inches (76 mm) in any direction. Select backfill shall have an average organic content of not more than 2%. Select backfill shall be placed where indicated on the Drawings. Select backfill is required where higher control of materials and placement is needed such as water retaining embankment cores, roadway embankments, and adjacent to structures.
- Select backfill may be material excavated for the WORK (native) or may be imported. The CONTRACTOR may blend native materials to achieve a material that meets the requirements for select backfill. Select backfill shall meet the following Unified Soil Classification System (ASTM D2487) designations: SW, SP, SP-SM, SP-SC, and SM. Materials classified as SP may be used only where the existing excavated and surrounding materials are confirmed by laboratory testing to be SP.
1. Berm and Water Retaining Embankments: CL, ML (These are fine-grained soils with -50-75% by dry weight passing through a No. 200 sieve; CL and ML are inorganic clay and silt, respectively, with a liquid limit less than 50%.) Levee fill material shall not contain any particles larger than 3 inches (76 mm) in diameter, and the upper 1-foot of the levee shall not contain particle sizes larger than 2 inches (51 mm) in diameter.
  2. Structure Backfill: SW, SP, SC (These are coarse-grained soils with greater than 50% by dry weight retained on a No. 200 sieve; SP and SW have less than 5% finer than a No. 200 sieve; SC has 12-50% finer than a No. 200 sieve.)

The following table displays select backfill maximum lift thickness and maximum particle size.



<b>SELECT BACKFILL</b>		
<b>STRUCTURE TYPE</b>	<b>MAXIMUM PARTICLE SIZE</b>	<b>MAXIMUM LOOSE LIFT THICKNESS</b>
<b>Water Bearing Berm</b>	3 inches	6 inches
<b>Non-Water Bearing Berm</b>	3 inches	12 inches
<b>Dam/Embankment</b>	3 inches	12 inches

Select Backfill shall meet the following FDOT gradation limits (AASHTO T27 and FM 1-T 011):

<b>BACKFILL GRADATION LIMITS</b>	
<b>SIEVE SIZE</b>	<b>PERCENT PASSING (%)</b>
3 ½ inches [90 mm]	90-100
¾ inch [19 mm]	70-100
No. 4 [4.75 mm]	30-100
No. 40 [425 µm]	15-100
No. 100 [150 µm]	5-65
No. 200 [75 µm]	0-15

- B. Random Backfill: Random backfill shall be clean, well-graded material, meeting one of the following Unified Soil Classification System (ASTM D2487) designations: SW, SP, SM, SC, SW-SM, SW-SC, SP-SM, and SP-SC, that is thoroughly mixed and free from debris, clods, and stones with a diameter in any direction greater than those specified in the below table. Random backfill shall have an organic content of less than 5% by weight. Tighter restrictions on stone size are considered in the top layer of fill, as per subsection 3.03 F. Final Dressing of Slopes, if the area is to be seeded, sodded, or landscaped. Random backfill shall be placed where indicated on the Drawings. Random backfill is required where stable backfill is needed to maintain slopes and grades, but shall not retain water or be adjacent to structures.

Random backfill may be material excavated for the WORK (native) or may be imported. The CONTRACTOR may blend native materials to achieve a material that meets the requirements for random backfill. Random backfill shall meet the CH (inorganic clays of high plasticity) Unified Soil Classification System (ASTM D2487) designation in addition to the classifications identified for select backfill.

Random backfill shall meet the below requirements with the largest particle diameter not exceeding 0.9 of the compacted layer thickness.

<b>RANDOM BACKFILL</b>		
<b>MAXIMUM PARTICLE SIZE</b>	<b>SURFACE DEPTH</b>	<b>MAXIMUM COMPACTED LIFT THICKNESS</b>
3 ½ inches	< 12 inches	6 inches
6 inches	12-24 inches	12 inches
12 inches	> 24 inches	12 inches

- C. **Unclassified Fill:** Unclassified Fill may be material used to bring areas to grade where there is no potential for slope erosion and the fill will not support a structure of critical function. Unclassified backfill shall be placed where neither select backfill nor random backfill are shown on the Drawing. Unclassified Backfill shall be composed of material excavated for the WORK or imported material that can be compacted to the required density.
- D. **Levee Fill Material:** Levee fill material shall consist of clean, granular materials that are free of debris, cinders, combustibles, roots, sod, wood, cellulose, organic material and materials subject to termite attack. Levee fill shall not have more than 12% passing the U.S. Standard Number 200 sieve (dry weight basis). The maximum particle size shall be 12 inches (305 mm) in any direction. Particles between 8 inches (203 mm) and 12 inches (305 mm) in diameter are considered “oversized materials” and shall not exceed 10% by volume of the levee fill material.
- E. **Unified Soil Classification System (USCS):** USCS is a two-letter classification system used to describe the texture and grain size of a soil. In the USCS system, letters are representative as follows: G stands for gravel, S stands for sand, M stands for silt, C stands for clay, O stands for organic, P stands for poorly graded, W stands for well graded, H stands for high plasticity, and L stands for low plasticity. Excavation: Excavation shall be the removal of all materials within the defined configuration to the limits of excavation shown on the Project Drawings, excluding stripping material.
- F. **Unsuitable Fill:** Soil that does not meet the requirements for fill (or backfill) addressed thus far in this SECTION shall be considered unsuitable fill soil.
- G. **Cohesionless materials:** These materials include gravels, gravel-sand mixtures, sands, and gravelly sands and are generally exclusive of clayey and silty materials (clayey and silty materials are free-draining, so impact compaction does not produce a well-defined moisture-density relationship curve).
- H. **Cohesive materials:** These materials include silts and clays and are generally exclusive of sands and gravel (sands and gravel are materials for which impact compaction produces a well-defined moisture-density relationship curve).
- 1.04 **SUBMITTALS:** The CONTRACTOR shall submit field measured cross-sections at each design cross-section for record purposes for excavations and embankments as described in this SECTION. The submittal of the field measured cross-sections shall be signed and sealed by a State of Florida licensed land surveyor. The CONTRACTOR shall submit to the DISTRICT detailed Work Plans for all work indicated or specified in this SECTION at least 14 days before the work is scheduled to begin.
- 1.05 **QUALIFICATIONS:**
- A. **Geotechnical Testing Agency Qualifications:** The CONTRACTOR will engage and pay for an independent testing agency qualified according to ASTM E 329 to perform Quality Control. This Quality Control involves conducting soil materials and rock-definition testing during earthwork operations, as documented according to ASTM D 3740.

- B. Earthwork Contractor Qualifications: The CONTRACTOR shall use an adequate number of skilled laborers and installers who are thoroughly trained and have a minimum of 5 years of successful experience in the necessary crafts and are completely familiar with the code requirements, the contract provisions, and the methods needed for the proper performance of the WORK of this SECTION. The CONTRACTOR shall employ the adequate resources and equipment necessary to successfully perform the WORK of this SECTION on schedule.

1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall excavate any material encountered to the depth and grades required, shall backfill such excavations as required, and shall dispose of excess or unsuitable materials from excavation as approved by the DISTRICT. The CONTRACTOR shall provide and place necessary borrow material to properly backfill excavations as indicated on the Drawings, specified herein, or as directed by the DISTRICT.
- B. Excavation, dewatering, sheeting, and bracing required shall be carried out so as to prevent any possibility of undermining or disturbing the foundations of any existing structure or WORK, and so that all WORK may be accomplished and inspected in the dry, except as directed by the DISTRICT. Aqueous construction may be performed only with prior written approval of the DISTRICT. Excavation and backfilling shall be in accordance with SECTION 02220 - Excavation and Backfilling.
- C. The CONTRACTOR shall furnish the services of a State of Florida licensed land surveyor for the field layout of all work indicated or specified in this section. The CONTRACTOR'S licensed land surveyor shall perform all initial site layout and shall provide follow-up verification of all work underway at a frequency of no less than once a week.

1.07 CERTIFICATIONS AND TESTING: CONTRACTOR shall furnish, at his own expense, all field density testing required to establish and maintain individual Quality Control (QC) processes required or specified in this SECTION. Field density tests shall be in accordance with ASTM Standards (some referenced herein) appropriate to each type of material used in backfilling. Failure to meet the specified density will require the CONTRACTOR to recompact and retest, at his own expense, those areas directed by the DISTRICT.

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 hours advanced notice of its intention to begin new WORK activities.

1.09 WARRANTY:

- A. The MANUFACTURER shall warrant the EQUIPMENT, MATERIALS and PRODUCTS specified in this SECTION against defective materials and workmanship with the MANUFACTURER'S standard warranty, but for no less than one year from the date of Final Completion, and as described in the General Conditions.
- B. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Final Completion and as described in the General Conditions.

**PART 2 - PRODUCTS**

2.01 MATERIALS ENCOUNTERED:

- A. The CONTRACTOR shall excavate all materials encountered which may include, but not necessarily be limited to: poorly graded granular sandy soils with variable percentages of finer materials, i.e., SP, SW, SP-SM, SP-SC, SM, SC, CH, CL-ML, CL to the lines, grades, dimensions and elevations as shown in the Drawings.

- B. The CONTRACTOR shall consider all materials encountered in excavations as suitable for use in random fill, provided that they achieve the required compaction as specified in this SECTION.
- C. The CONTRACTOR shall consider all materials encountered, regardless of type, character, composition and condition thereof unclassified other than as indicated in Article 1.03 Definitions. The CONTRACTOR shall estimate the quantity of various materials included prior to submitting the Bid Form. Rock encountered shall be handled by the CONTRACTOR at no additional cost to DISTRICT.

### **PART 3 - EXECUTION:**

#### **3.01 SITE PREPARATION:**

- A. Clearing and Demolition: The CONTRACTOR shall perform clearing and demolition as specified in SECTION 02110 - Clearing and Land Preparation and SECTION 02050 - Demolition.
- B. Stripping: The CONTRACTOR shall remove topsoil from areas within limits of excavation and areas designated to receive compaction as shown on the Drawings, required and as provided below:
  - 1. Scrape area clean of all brush, grass, weeds, roots, and other material.
  - 2. Strip to a minimum depth of approximately six (6) inches or to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required segregating topsoil. All roots and branches 1/2 inch in diameter or greater shall be removed.
  - 3. Stockpile topsoil in areas where it will not interfere with construction operations or existing facilities. Stockpiled topsoil shall be reasonably free of subsoil, debris and stones larger than two inches in diameter.

#### **3.02 EXCAVATION AND TRENCHING:**

- A. Sheeting and Bracing: The CONTRACTOR shall provide sheeting and bracing as required or shown in accordance with the following provisions.
  - 1. Use when required by the specifications or Drawings and where resulting slopes from excavation or trenching might endanger the structural integrity of in-place or proposed structures.
  - 2. Provide materials on site prior to start of excavation. Adjust spacing and arrangement as required by conditions encountered.
  - 3. Remove sheeting and bracing as backfill progresses. Fill voids left after withdrawal with sand or other approved material.
  - 4. In-place structures damaged by sheeting and bracing activities shall be repaired by the CONTRACTOR at no additional cost to the District.
  - 5. Comply with all applicable sections of OSHA.
  - 6. Comply with all requirements of the Florida Trench Safety.
- B. Blasting: Blasting will not be permitted.
- C. Excavation for Structures: The CONTRACTOR shall perform excavation for structures as shown, required and specified below:
  - 1. Excavate area adequate to permit efficient erection and removal of forms.
  - 2. Excavate by hand in areas where confined space and access restricts the use of machines.
  - 3. Notify the DISTRICT immediately when excavation has reached the depth indicated on plans.
- D. Primary Excavation: The CONTRACTOR shall perform Primary excavation by any method meeting the requirements of these specifications and the Drawings. Transitions in bottom width and elevation

shall be uniform. The excavated slopes and bottom of the created wetlands and streambed shall be left as smooth as skilled use of the excavating equipment will permit.

1. A construction tolerance of 0.25 foot above or below the lines and grades indicated shall be permitted; however, the cross sectional area shall not be less than designed.
    - a. The CONTRACTOR shall provide field measured cross-sections of the "As-Built" conditions to the DISTRICT, plotted at the same stations as the detailed cross-sections shown on the plans to show the above specified tolerance has been met.
  2. Sufficient quantities of peat or topsoil may be placed near the limits of fill for use in final dressing of fill side slopes.
- E. Demucking: The CONTRACTOR shall remove all organic soils from areas below structures, piping, and road subgrades to the lines and grades as shown in the Drawings. Materials excavated shall not be used for backfill of structures or pipes and shall be placed in random fill zones only. Organic soils (including peat) shall be used in random fill in the top layer of the final dressing.
- F. Excavation of Existing Embankments: The CONTRACTOR shall perform excavation by any method acceptable to the DISTRICT and by meeting the requirements of these specifications and the Drawings. All materials removed from embankments shall be suitable for reuse as random fill. Excavation limits shall be clearly identified and approved by the DISTRICT prior to initiation of the WORK.
- G. Cross-Sections: For payment and record purposes, the Contractor shall submit field measured cross-sections as required by the DISTRICT.

### 3.03 EMBANKMENT:

- A. Embankment:
1. Embankment shall consist of a select backfill core and random backfill side slopes (unless otherwise indicated) and shall be placed to the lines and grades as shown on the Drawings. At no location shall the completed top elevation be lower than indicated. Embankment side slopes indicated are nominal, and may be varied. Completed side slopes shall be uniform from top to toe of the embankment, and shall be smoothly transitioned. The CONTRACTOR shall perform embankment WORK as shown on the Drawings, required and in accordance with these specifications.
    - a. Materials suitable for select fill shall be placed in the central core of the levee in horizontal layers not exceeding 12 inches in loose thickness and compacted as indicated.
    - b. Random fill shall be placed to its final position on each side of the select fill concurrent with select fill placement.
    - c. Rocks exceeding the acceptable size shall be either stockpiled or crushed to the acceptable size for use. The acceptable sizes of rocks are shown in the Definitions Section of this specification.
  2. Cohesive soils shall be compacted to not less than 95% of the maximum density at optimum moisture content determined by accordance with ASTM D698. Cohesionless materials shall be compacted to not less than 80% relative density determined in accordance with ASTM D4253 and D4254.
- B. Roadway and Access Berm Embankment: The CONTRACTOR shall construct embankments for roadways and access berms in accordance with the requirements of SECTION 120 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction.
- C. Final Dressing of Slopes: Following the completion of embankment placement and compaction, the CONTRACTOR shall grade embankment slopes and adjacent transition areas so that they are reasonably smooth and free from irregular surface changes. The CONTRACTOR shall comply with the following:

1. In areas where the embankment is to have grass, sod, or landscaping, the material within the top one foot of the levee, shall be free of any rocks greater than 2 inches (51 mm) in diameter.
  2. The degree of finish shall be that ordinarily obtained from blade grader or similar operations.
  3. Provide roundings at bottom of slopes and other breaks in grade.
- D. Cross-Sections: Provide field measured cross-sections of the final embankments to the DISTRICT for payment and record purposes, plotted at the same stations as the detailed cross-sections shown on the plans.

3.04 BACKFILLING:

- A. Structure Backfill: The CONTRACTOR shall place structural backfill in accordance with the lines, grades, and cross-sections shown in the Drawings or as ordered by the DISTRICT. The CONTRACTOR shall backfill using select fill. Stones or rocks greater than 2 inches (51 mm) in any dimension shall not be placed within 12 inches of the structure. Lifts shall not exceed 12 inches. The following procedures shall be adhered to:
1. Structure backfill shall be compacted to not less than 95% maximum dry density as measured by ASTM D1557.
  2. Remove all debris from excavation prior to placement of material.
  3. Place backfill in level layers of thickness within the compacting ability of equipment used.
  4. Perform backfilling simultaneously on all sides of structures. For walls, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.
- B. Unclassified Backfill: The CONTRACTOR shall ensure that unclassified backfill be placed in 12 inch loose lifts to the lines and grades shown on the Drawings or as approved by the DISTRICT. The CONTRACTOR shall compact unclassified backfill to a density approximating the density of surrounding native material and in a manner that will prevent settlement of the completed area.

3.05 MAINTENANCE:

- A. The CONTRACTOR shall protect newly graded areas from actions of the elements.
- B. The CONTRACTOR shall fill, repair, and re-establish grades to the required elevations and slopes for any area that shows settling or erosion occurring prior to finishing.
- C. The CONTRACTOR shall maintain grassed and landscaped areas in accordance with SECTIONS 02486 and 02930, respectively.

END OF SECTION

SECTION 02220 EXCAVATION AND BACKFILLING

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, materials, and equipment to perform the excavation and backfilling as shown on the Drawings.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 02110 – Clearing and Land Preparation
  - 2. SECTION 02200 – Earthwork
  - 3. SECTION 02401 – Dewatering and Cofferdam
  - 4. SECTION 02402 - Bypass

1.02 APPLICABLE PUBLICATIONS:

- A. American Society of Testing Materials (ASTM)
  - 1. D698 Standard Test Methods for Laboratory compaction Characteristics of Soil Using the Standard Effort (56,000 ft-lbf/cu. ft.)
  - 2. D1557 Standard Test Methods for Laboratory compaction Characteristics of Soil Using the Modified Effort (12,400 ft-lbf/cu. ft.)
  - 3. D4253 Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
  - 4. D4254 Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
- B. Florida Department of Transportation
  - 1. Standard Specifications for Road and Bridge Construction, latest edition, (FDOT)

1.03 DEFINITIONS: (Not Applicable)

1.04 SUBMITTALS: The CONTRACTOR shall submit, prior to the start of work, the planned method of construction of the embankments shown on the Drawings, or as specified herein, for the DISTRICT'S review. This plan shall also indicate the intended construction sequence for backfilling operation.

1.05 QUALIFICATIONS: (Not Applicable)

1.06 RESPONSIBILITIES: (Not Applicable)

1.07 CERTIFICATIONS AND TESTING: Field density tests in accordance with ASTM Standards, for each type of material used in backfilling may be required. Failure to meet the specified density will require the CONTRACTOR to recompact and retest, at its own expense, those areas directed by the DISTRICT.

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide the District at least 48 hours advance notice of its intention to begin new WORK activities.

1.09 WARRANTY:

- A. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Final Completion and as described in the contract documents.

## **PART 2 - PRODUCTS**

- 2.01 STRUCTURAL BACKFILL: The CONTRACTOR shall provide satisfactory structural backfill material which shall consist of material free of muck, stumps, rocks, or other material considered unacceptable by the DISTRICT. The general requirements for fill shall be in accordance with SECTION 02200 Earthwork and FDOT 120-7.1 and 7.2.
- 2.02 EMBANKMENT FILL: The CONTRACTOR shall provide embankment fill free of muck stumps, roots, brush, vegetation or other material considered undesirable by the DISTRICT to be placed in upland areas. Embankment fill containing muck free of stumps, roots, brush, vegetation or other material considered undesirable by the DISTRICT may be utilized in zones where wetland plants are proposed. The general requirements of embankment fill shall be in accordance with SECTION 02200 Earthwork and FDOT 120-7.1 and 7.2.

## **PART 3 - EXECUTION**

### **3.01 SITE PREPARATION:**

- A. Clearing and Grubbing: The CONTRACTOR shall perform clearing and grubbing in accordance with SECTION 02110 Clearing and Land Preparation and with the following provisions:
1. Perform only in areas where earthwork or other construction operations are to be performed or otherwise shown on Drawings.
  2. Protect tops, trunks, and roots of existing trees that are to remain on the site.
  3. Clear areas and dispose of other trees, brush and vegetation before starting construction.
  4. Remove tree stumps and roots larger than three inches in diameter and backfill resulting excavations with approved material.
- B. Stripping: The CONTRACTOR shall remove topsoil from areas within limits of excavation and areas designated to receive compaction as shown on the Drawings, required and as provided below:
1. Scrape area clean of all brush, grass, weeds, roots, and other material.
  2. Strip to depth of approximately six inches or to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required segregating topsoil.
  3. Stockpile topsoil in areas where it will not interfere with construction operations or existing facilities. Stockpiled topsoil shall be reasonably free of subsoil, debris and stones larger than two inches in diameter.

- 3.02 DISPOSAL OF SURPLUS AND UNSUITABLE MATERIAL: The CONTRACTOR shall dispose of all excess or unsuitable material off-site or in areas otherwise approved by the DISTRICT.

- 3.03 STOCKPILE OF EXCAVATED MATERIAL: The CONTRACTOR shall stockpile excavated materials in areas shown on the Drawings or in areas otherwise approved by the DISTRICT.

- 3.04 PLACEMENT OF STRUCTURAL FILL: The CONTRACTOR shall place structural backfill true to the lines, grades and, cross sections shown in the Drawings or as ordered by the DISTRICT. Structural backfill shall be deposited by the CONTRACTOR in horizontal layers not exceeding eight inches in depth measured loose, and shall be compacted to a density of not less than 95 percent of the maximum density at optimum soil moisture content +/- 2% as determined by ASTM D1557 Standards. Backfill shall not be placed against fresh concrete without the approval of the DISTRICT.

- 3.05 PLACEMENT OF EMBANKMENT FILL: The CONTRACTOR shall construct embankments true to the lines, grades, and cross sections shown on the Drawings or as directed by the DISTRICT. Fill for embankments shall be placed by the CONTRACTOR in successive layers of not more than twelve inches in thickness, measured loose, for the full width of the embankment. Each layer of the material used in the formation of the embankments shall be compacted by the CONTRACTOR to a density of at least 95 percent of the maximum



density as determined by ASTM D1557 Standards. Unreasonable roughness of the surface shall be dressed out. Rocks and boulders shall not project above the finished surfaces. All areas disturbed shall be graded by the CONTRACTOR so that water drains freely at all points after construction.

- 3.06 COMPACTION EQUIPMENT: When placing fill adjacent to foundations or retaining walls, heavy equipment for spreading and compacting fill shall not be operated closer than a distance equal to the height of backfill above the top of the footing; the area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the materials being compacted. Backfill shall be placed carefully around pipes or tanks to avoid damage to coatings, wrappings, or tanks. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.
- 3.07 GRADING: The CONTRACTOR shall perform grading as shown on the Drawings, required, and provided for below:
- A. Grade and compact all areas within the project area, including excavated and filled sections and adjacent transition areas, reasonably smooth, and free from irregular surface changes.
  - B. Degree of finish shall be that ordinarily obtained from blade grader or scraper operations except as otherwise specified.
  - C. Finished grades shall comply with grading tolerances provided in Section 02200.
  - D. Finish all ditches, swales, and gutters to drain readily.
  - E. Provide roundings at top and bottom of banks and at other breaks in grade.
- 3.08 CLEANUP: The CONTRACTOR shall cleanup the site as required and provided for below, to the satisfaction of the District:
- A. Clear surfaces of all stones, roots, grading stakes, and other objectionable materials.
  - B. Keep paved areas clean and promptly remove rock or dirt dropped upon surfaces.
- 3.09 PROTECTION AND MAINTENANCE: The CONTRACTOR shall maintain the embankments until final acceptance of all work. The maintenance shall include repairs of any erosion, slides, or other damages.

END OF SECTION

## SECTION 02221 TRENCHING, BACKFILLING AND COMPACTING

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, materials and equipment necessary for complete and proper trenching, backfilling and compacting as specified herein.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 02200 Earthwork
  - 2. SECTION 02220 Excavation and Backfilling
  - 3. SECTION 02221 Trenching, Backfilling and Compacting
  - 4. SECTION 02402 Bypass

#### 1.02 APPLICABLE PUBLICATIONS:

- A. American Society of Testing Materials (ASTM):
  - 1. D698 - Standard Test Methods for Laboratory compaction Characteristics of Soil Using the Standard Effort (12,400 ft-lbf/ ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
  - 2. D1557 - Standard Test Methods for Laboratory compaction Characteristics of Soil Using the Modified Effort (56,000 ft-lbf/ ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
  - 3. D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
  - 4. D4254 - Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
- B. Florida Department of Transportation (FDOT):
  - 1. Standard Specifications for Road and Bridge Construction, latest edition, (FDOT)
- C. Miscellaneous Project Data:
  - 1. Subsurface soil data logs are provided for the CONTRACTOR'S reference:

#### 1.03 DEFINITIONS: (Not Applicable)

#### 1.04 SUBMITTALS: (Not Applicable)

#### 1.05 QUALIFICATIONS: (Not Applicable)

#### 1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall make all excavations for piping and appurtenant structures in any material encountered to the depth and grades required, shall backfill such excavations and dispose of excess or unsuitable materials from excavation, and shall provide and place necessary borrow material to properly backfill excavations, all as indicated on the drawings, specified herein, or as directed by the DISTRICT.
- B. Excavation, dewatering, sheeting and bracing required shall be carried out so as to prevent any possibility of undermining or disturbing the foundations of any existing structure or work, and so that

all work may be accomplished and inspected in the dry, except as directed by the DISTRICT. Aqueous construction may be performed only with prior approval of the DISTRICT.

1.07 CERTIFICATIONS AND TESTINGS: (Not Applicable)

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 hours notice of its intention to begin new WORK activities.

1.09 WARRANTY:

- A. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Final Completion and as described in the contract documents.

**PART 2 - PRODUCTS**

2.01 MATERIALS: The CONTRACTOR shall furnish materials as required to complete the Work under this Section.

**PART 3 - EXECUTION**

3.01 EXTENT OF OPEN EXCAVATION: The CONTRACTOR shall perform the excavation such that at any time the amount of excavation open will be held to a minimum consistent with normal and orderly prosecution of the work, or as restricted by permit conditions.

3.02 TRENCH EXCAVATION: The CONTRACTOR shall perform trench excavation in accordance with the following.

- A. All excavation for piping shall be open cut. Trench sides shall be approximately vertical between an elevation of one foot above the top of the pipe and the centerline of the pipe; otherwise, trench sides shall be as vertical as possible or as required. Trenches may be excavated by machinery to a depth that will not disturb the finish grade.
- B. Trench width shall be as narrow as practical and shall not be widened by scraping or loosening material from the sides.

3.03 EXCAVATION BELOW NORMAL GRADE:

- A. In the event the CONTRACTOR through error or carelessness excavates below the elevation required, the CONTRACTOR shall at his own expense backfill with selected gravel and compact to obtain a suitable pipe bedding all as directed and to the satisfaction of the DISTRICT.
- B. In the event unstable or unsuitable bedding material is encountered at or below the pipe bedding level, the CONTRACTOR shall remove such material and replace it with suitable compacted material.

3.04 BACKFILLING TRENCHES:

- A. The CONTRACTOR shall be responsible for obtaining the necessary inspections before, during and after backfilling and shall re-excavate, refill and perform all such related work to obtain satisfactory test results.
- B. The CONTRACTOR shall use excavated materials classified as embankment fill for backfilling and such grading on the site as is required. The CONTRACTOR shall dispose of any excess fill or unstable material in areas approved by the DISTRICT. Pipe trenches shall be backfilled with fine, loose embankment fill (see SECTION 02220, paragraph 2.02), free from large stones, carefully deposited on both sides of pipe and thoroughly and carefully rammed until enough fill has been placed

to provide a cover of at least one foot above the pipe. The remainder of the backfill material may then be thrown in and tamped. Water settling may be permitted. The CONTRACTOR shall submit written request detailing the need to perform water settling and reasons why work in the dry is not possible. The CONTRACTOR shall also submit detailed procedures for the review and approval of the DISTRICT. Whenever trenches have not been properly filled, or if settlement occurs, they shall be refilled, smoothed off and finally, made to conform to the surface of the ground. Backfilling shall be carefully performed and the surface restored to the elevation shown on the plans. In unpaved areas the surface of trenches shall conform and be equal to quality, character and material of the surface immediately prior to making the excavation.

C. Place earth embedment as follows:

1. With level bottom layer at proper grade to receive and uniformly support pipe barrel throughout its length.
2. Form shallow depression under each joint to facilitate jointing.
3. Add second layer simultaneously to both sides of the pipe with care to avoid displacement of the pipe.
4. Place material in maximum 12-inch lifts.

3.05 BACKFILLING OF TRENCH UNDER ROADWAY: The CONTRACTOR shall place material in 12-inch maximum layers after filling one foot above pipe as previously described. Each layer shall be compacted to 95 percent maximum dry density as measured by ASTM D1557 so that pavement can be placed promptly. Any pavement cut or area disturbed by this work shall be replaced to match existing.

3.06 BACKFILLING OF TRENCH OPEN AREAS: The CONTRACTOR shall place material in 12-inch maximum lifts after filling one foot above pipe as previously described. The top one-foot layer shall be compacted to 90 percent maximum dry density as measured by ASTM D1557. Each layer shall be compacted to the density of adjacent soils. Restore the surface to original grade and place sod or seed as required by the contract documents.

END OF SECTION

## SECTION 02262 STEEL SHEET PILING

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, materials, and equipment necessary to install all temporary and permanent sheet piling, including wales, tie rods, and bolts, for the structure as indicated on the Drawings and specified herein.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01300 - Submittals

#### 1.02 APPLICABLE STANDARDS AND PUBLICATIONS:

- A. Standards or Codes: The edition of the publications of the organizations listed below in effect at the time of the advertisement for bids form a part of this specification to the extent referenced. See the various paragraphs for the specified standard. In the case of a conflict between the requirements of this SECTION and those of the listed document, the requirements of this SECTION shall prevail.
  - 1. American Society for Testing and Materials (ASTM):
    - a. A36 - Standard Specification for Carbon Structural Steel
    - b. A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi (kips per square inch) Minimum Tensile Strength
    - c. A328 - Standard Specification for Steel Sheet Piling
    - d. A563 - Standard Specification for Carbon and Alloy Steel Nuts [Metric]
    - e. A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
    - f. A668 - Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use
  - 2. American Welding Society (AWS):
    - a. AWS D1.1 - Structural Welding Code - Steel

#### 1.03 DEFINITIONS: (Not Applicable)

#### 1.04 SUBMITTALS:

- A. The CONTRACTOR shall make submittals for Steel Sheet Piling in accordance with SECTION 01300 and the following provisions. The CONTRACTOR shall be responsible for coordination of materials, equipment, and installation regardless if the submittals are made together or separately.
  - 1. For Temporary Sheet Piles:
    - a. The CONTRACTOR shall submit the temporary steel sheet pile design signed and sealed by a Professional Engineer registered in the State of Florida.
    - b. Submit fabrication and erection drawings for temporary piling, wales, tie rods, and accessories prior to installation signed and sealed by a Professional Engineer registered in the State of Florida.
    - c. Make and model of pile-driving hammer.
    - d. Weight of capblock assembly, cushion dimensions, type of cushion material, and cushion stiffness.

- B. During pile driving, the CONTRACTOR shall submit records to the DISTRICT each day including the following for each temporary and permanent sheet pile:
1. Name of structure and pile number
  2. Driven pile length
  3. Pile length after cut off
  4. Pile cut off and tip elevations
  5. Ground surface elevation during driving
  6. Final driving resistance and pressure gauge readings or hammer stroke
  7. Date and time of day pile is driven
  8. Heaving or redriving data
  9. Remarks concerning pile-driving operations

1.05 QUALIFICATIONS:

- A. Experience Requirement:
1. The CONTRACTOR shall have a minimum of five (5) years experience installing steel sheet piles.

1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall be responsible for layout of the piles to the location shown on the Drawings. The CONTRACTOR shall establish monitoring devices and benchmarks as required to complete the WORK. The DISTRICT shall provide elevation reference for the CONTRACTOR to mark each pile along its entire length at one (1) foot intervals and along at least the last foot of driving at one (1) inch increments, so as to permit determination of the pile tip elevation and corresponding driving resistances during driving.

1.07 CERTIFICATIONS AND TESTING: Not Used

1.08 INSPECTION COORDINATION:

- A. The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide at least 48-hour advance notice of its intention to begin new WORK activities.

1.09 WARRANTY:

- A. The CONTRACTOR shall warrant the WORK against defects for one (1) year from the date of Final Completion and as described in the contract documents.

**PART 2 - PRODUCTS**

2.01 DRIVEN STEEL SHEET PILES:

- A. The CONTRACTOR shall provide Steel Sheet Pile in accordance with the following:
1. Sheet piles shall be the size and make as shown on Drawings or approved equal.
  2. Sheet piles shall not have a camber or sweep in excess of the permitted mill tolerance.
  3. Store on platforms, skids or other supports at the Site and support to prevent excessive deflection.

4. Sheet pile points shall be reinforced with protector as manufactured by Associated Pile and Fitting Corporation or DISTRICT approved equal. Points shall be welded to the piles in accordance with the MANUFACTURER's recommendations and conforming to ASW D1.1.
- B. The CONTRACTOR shall drive steel sheet piles to the specified elevation.
- C. The CONTRACTOR shall provide equipment for driving steel sheet piles as required to complete the WORK and as specified below:
1. The sheet piles shall be driven with an approved single, partial double-acting or double-acting steam, air, diesel or vibratory hammer.
  2. The pile driving hammer shall be operated at all times at the speeds and conditions recommended by the hammer MANUFACTURER.
  3. The boiler or compressor capacities for the steam or air-operated hammers shall be sufficient to operate the hammer continuously at the full rated speed and energy.
  4. For the steam- or air-operated hammer drivers, the CONTRACTOR shall provide a pressure gauge to be located on the hammer steam or airline in a position such that it can be clearly read by the pile driver operator.
  5. For the double-acting diesel hammers, the CONTRACTOR shall provide a pressure gauge to be located in a position such that it can be clearly read by the pile driver operator.
  6. For a single-acting diesel hammer, the CONTRACTOR shall mark the ram as approved by the DISTRICT to permit determination of the stroke.
- D. Capblock and Cushion:
1. The CONTRACTOR shall submit to the DISTRICT details concerning the stiffness of the capblock and cushion assembly and the coefficient of restitution and weight of the capblock and cushion assembly two (2) weeks prior to driving.
- E. The CONTRACTOR shall provide Wales, Plate and Washers conforming to ASTM A36.
- F. The CONTRACTOR shall provide tie rods conforming to ASTM A572 for 65 ksi or A36 for 36 ksi yield stress.
- G. The CONTRACTOR shall provide bolts and nuts as follows:
1. Bolts shall conform to A325, otherwise as indicated on the Drawings.
  2. Nuts shall conform to ASTM A563.
- H. The CONTRACTOR shall provide turnbuckles conforming to ASTM A563.
- I. The CONTRACTOR shall provide shop protective coatings as follows:
1. Apply to all wales, tie rods, and accessories.
  2. Apply to all sheet piling except as otherwise indicated.

### **PART 3 - EXECUTION**

- 3.01 **DRIVEN SHEET PILES:** The CONTRACTOR shall provide pile driving equipment and drive steel sheet piles in accordance with the following:
- A. Templates: A template shall be provided for each location and be constructed to locate the relative position of the proposed piling layout.
- B. Equipment for Driving Steel Sheet Piles:

1. All pile-driving equipment shall be subject to the DISTRICT's approval after inspection at the job Site.
2. At any time during the progress of the WORK, equipment, which in the DISTRICT's opinion, is in poor operating condition will not be approved for pile installation.

C. Driving Procedure:

1. Sheet piles shall not be driven until inspected and approved for driving.
2. No piles shall be driven within 100 feet of concrete less than seven (7) days old, unless authorized by the DISTRICT.
3. Drive piles in contact with surrounding soil and leave all permanent piles in place.
4. Do not drive coated piling until coating has cured a minimum of one (1) week (7 days).
5. Prior to driving pilings in water, a horizontal line shall be painted on both sides of each piling at a fixed distance from the bottom so that it is visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed pilings so potential problem areas can be identified by abrupt changes in elevation.
6. Pilings shall be driven with the proper size hammer and by approved methods to ensure no damage to the piles and proper interlocking over their entire lengths. Driving hammers shall be maintained in proper alignment during driving operations by the use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock melt or other damage. The use of vibratory hammers should be discontinued and impact hammers employed whenever the penetration rate due to vibratory loading is one (1) foot or less per minute.
7. A protective cap shall be employed during driving when using impact hammers to prevent damage to the tops of the pilings. Pilings damaged during driving or those driven out of interlock shall be removed and replaced at the CONTRACTOR's expense.
8. Pilings shall be driven without the aid of a water jet, unless authorized by the DISTRICT. Adequate precautions shall be taken to ensure that pilings are driven plumb. If the forward or leading edge of the piling wall is found to be out of plumb, the piling being driven shall be driven to the required depth and tapered pilings shall be driven to interlock with the out-of-plumb leading edge. If approved, other corrective measures may be employed to ensure that succeeding pilings are plumb. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.
9. Pilings in each run or continuous length of piling wall shall be driven alternately, in increments of depth, to the required elevation. No piling shall be driven to a lower elevation than those behind it in the same run, except when the pilings behind it cannot be driven deeper. If the piling next to the one being driven tends to follow below final elevation, it may be pinned to the next adjacent piling. If obstructions restrict driving a piling to the specified elevation, the obstructions shall be removed or penetrated with a chisel beam. If the CONTRACTOR demonstrates that removal or penetration is impractical, the CONTRACTOR shall make changes in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings shall be driven to the depths shown and shall extend up to the elevation indicated for the tops of the piles.

D. Bearing Elevation:

1. The sheet piles shall be driven to the bearing elevation indicated on the Drawings.

E. Cutoff:

1. Piles shall be cut off perpendicular to the vertical axis of the pile and to within one half inch of the cutoff elevation indicated.
2. Remove the portion of the pile cut off from the Site.



3. If excavation is required to achieve pile cutoff, remove the excess excavated materials as directed by the DISTRICT.
  4. Splicing shall not be permitted without approval of the DISTRICT.
- F. Installation Tolerance:
1. Tolerances in Driving: All piles shall be driven with a variation of not more than one quarter inch per foot of pile length from the vertical for plumb piles. Top of pile shall be within three (3) inches of the location indicated. Manipulation of piles to force them into position will not be permitted. All piles will be checked for heave. Piles found to have heaved shall be redriven to the required point elevation.
- G. Predrilling and Jetting:
1. Predrilling or jetting will not be permitted without written approval from the DISTRICT.
- H. Rejected Piles:
1. The DISTRICT will determine the acceptability of all piles driven and may reject those piles that do not conform to the specifications.
  2. Perform one of the following, as directed by the DISTRICT, for those piles that have been rejected.
    - a. Leave the piles in place, cut off as directed and drive one or more new piles in locations designated by the DISTRICT.
    - b. Withdraw the pile and drive a new pile.
- I. Sheet Pile Bracing: Install permanent wales, tie rods and accessories as indicated.
- J. Provide temporary bracing as required prior to installation of permanent bracing.

END OF SECTION

SECTION 02370 RIPRAP SYSTEM

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish stone riprap, bedding stone and filter fabric for construction of channel lining where indicated, including temporary riprap for bypass channel(s).

1.02 RELATED WORK REFERENCED ELSEWHERE:

- A. SECTION 01300 – Submittals  
B. SECTION 02778 - Geotextiles

1.03 APPLICABLE PUBLICATIONS: The following standard specification shall apply to the WORK of this SECTION:

- A. American Society for Testing and Materials (ASTM):
1. C127 - Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Course Aggregate
  2. C535 - Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- B. American Association of State Highway and Transportation Officials (AASHTO)
1. T 85 Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate
  2. T 120 Method of Test for Aggregate Durability Index
- C. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, (FDOT)

1.04 DEFINITIONS: (Not Used)

1.05 SUBMITTALS: Furnish submittals in accordance with SECTION 01300 Contractor Submittals. The CONTRACTOR shall furnish to the DISTRICT, testing certificates from a qualified independent testing laboratory prior to acceptance of the rock source to verify the conformity to the requirements of the Contract Documents.

1.06 QUALIFICATIONS: (Not Used)

1.07 RESPONSIBILITIES: (Not Used)

1.08 CERTIFICATIONS:

- A. Test Reports: The CONTRACTOR's rubble riprap supplier shall submit certified test reports prepared by a qualified independent testing laboratory selected and compensated by CONTRACTOR for the tests required in Article 2.01 B of this SECTION. The table shown below specifies the minimum number of tests for each Project to establish quality control during the processing of a single 2,500-ton stockpile.

Test Required	Number of Tests	Test Method
Specific Gravity	2	ASTM C127
Absorption	2	ASTM C127, AASHTO T 85

Test Required	Number of Tests	Test Method
Soundness	2	ASTM C88
Durability Index	2	AASHTO T 210
L.A. Abrasion	2	FM 3-C 535
Gradation	1	FM 5-538

- B. Filter Fabric: The CONTRACTOR shall submit MANUFACTURER's data for filter fabric demonstrating compliance with specified material properties, and including MANUFACTURER's recommendations for storage, handling, installation, and anchoring fabric.

1.09 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide the DISTRICT 48 hours advance notice of its intention to begin new WORK activities.

1.10 WARRANTY:

- A. The MANUFACTURER shall warrant the MATERIALS and PRODUCTS specified in this section against defective materials and workmanship with the MANUFACTURER's standard warranty, but for no less than one (1) year from the date of Final Completion, and as described in the contract documents.
- B. The CONTRACTOR shall warrant the WORK against defects for one (1) year from the date of Final Completion and as described in the contract documents.

## **PART 2 - MATERIALS**

2.01 RIPRAP: The CONTRACTOR shall furnish stone for riprap that shall be sound, durable and angular in shape. No more than 10% of the stone for any gradation shall have an elongation (ratio of greatest dimension to least dimension) greater than 3:1, and no stone shall have an elongation greater than 4:1. The riprap material shall be provided by a Florida Department of Transportation (FDOT) certified pit and conform to the following additional requirements.

- A. Material shall be free from cracks, seams, non- mineralized or other defects that would tend to increase its deterioration from natural causes. Riprap shall consist of dense, natural rock fragments. Stones shall be resistant to weathering and to water action; free from overburden, spoil, shale and organic material; and shall meet the gradation requirements below. Shale and stones with shale seams are not acceptable.
- B. Stone for riprap shall have the following properties:
1. Bulk specific gravity (saturated surface-dry basis) not less than 2.38 when tested by ASTM C127 for gradations A, B, and C, and D.
  2. The minimum apparent specific gravity of the stones shall be 2.5 as determined by AASHTO T 85.
  3. Absorption of not more than 5.0% when tested by ASTM C127.

4. Stones shall consist of durable, sound, hard, angular rock meeting the following requirements for durability absorption ratio, soundness test, and abrasion test:

Durability Absorption Ratio

Acceptability

Greater than 23

Passes

10 to 23

Passes only if Durability Index is 52 or greater

Less than 10

Fails

Durability Index (Coarse)

Durability Absorption Ratio =

% absorption + 1

5. The durability index and percent absorption shall be determined by AASHTO T 210 and AASHTO T 85, respectively. The minimum apparent specific gravity of the stones shall be 2.5 as determined by AASHTO T 85.
6. Stones shall have a wear not greater than 40 percent, when tested per ASTM C535.
7. Stone gradation based on a representative sample of not less than 2.0 cubic yards. Each stone in the sample shall be individually weighed, and a cumulative plot of percent lighter (by weight) versus stone weight in pounds shall be submitted.

- C. The riprap shall be graded as follows:

<b>Type A (6-inch Average Size)</b>		
<b>Sieve Size</b>		<b>Percent Passing by Weight</b>
<b>Maximum</b>	<b>Minimum</b>	
<b>12"</b>	<b>9"</b>	<b>100</b>
<b>8"</b>	<b>7"</b>	<b>50</b>
<b>6"</b>	<b>5"</b>	<b>15</b>

- D. Control of gradation shall be by visual inspection. The CONTRACTOR shall furnish a sample of the proposed gradation of at least five (5) tons or ten (10) percent of the total riprap weight, whichever is less. If approved, the sample may be incorporated into the finished riprap at a location where it can be used as a frequent reference for judging the gradation of the remainder of riprap. Any difference of opinion between the DISTRICT and the CONTRACTOR shall be resolved by dumping and checking the gradation of two random truckloads of stones. Arranging for and the costs of mechanical equipment, a sorting site, and labor needed in checking gradation shall be the CONTRACTOR's responsibility.

- E. The acceptability of the stones will be determined by the DISTRICT prior to placement.

- 2.02 **GRANULAR BEDDING:** The CONTRACTOR shall place a blanket of bedding material beneath the riprap materials to the lines and grades shown on the drawings. Stone for use in granular bedding shall weigh not less than 135 lbs/cf (saturated surface dry). The material shall be composed of tough, durable particles, shall be reasonably free from thin, flat and elongated pieces, and shall contain neither organic matter nor soft, friable particles in quantities considered objectionable by the DISTRICT. Bedding stone shall be placed within the limits shown on the drawings and shall be reasonably well graded in accordance with FDOT Section 901, Standard Specifications for Road and Bridge Construction, latest edition. The bedding stone for each type of riprap shall be as follows:

Type of Riprap	Bedding Stone
Type A	ASTM C33 Size No. 57

- 2.03 FILTER FABRIC: The CONTRACTOR shall provide geotextile (filter) fabric conforming to the requirements of FDOT Section 985 for drainage applications.
- 2.04 TEMPORARY RIPRAP: The CONTRACTOR shall furnish temporary riprap as indicated on the Drawings conforming to the requirements of Part 2 of this SECTION for Gradation A.

### **PART 3 - PERFORMANCE**

#### **3.01 FIELD QUALITY CONTROL:**

- A. The CONTRACTOR shall recombine the riprap stone sample used for gradation analysis, transport to the Project Site, and place in a location acceptable to the DISTRICT. Field control of riprap gradation will be by visual comparison of the representative sample to arriving loads. Arriving loads not bearing reasonable similarity to the sample will be rejected.
1. CONTRACTOR may, at his option, arrange for gradation analysis of rejected loads at the Project Site. Should the analysis indicate the rejected stone meets the requirements of this SECTION; all reasonable costs for such analysis will be reimbursed to the CONTRACTOR. In no instance will stone of a coloration or appearance dissimilar to that in the sample be accepted.

#### **3.02 SUBGRADE PREPARATION:**

- A. Dry Installation: The CONTRACTOR shall prepare the subgrade to the lines, slopes and elevations indicated. The CONTRACTOR shall clear the subgrade of sticks, stones, debris and other materials that could puncture the overlying filter fabric. The finished subgrade shall not vary from design grade by more than 2" at any location.

- 3.03 FILTER FABRIC: The CONTRACTOR shall provide filter fabric in accordance with the requirements of FDOT Section 514. Filter fabric shall be placed only on subgrade approved by the DISTRICT.

- 3.04 GRANULAR BEDDING: The CONTRACTOR shall place bedding material beneath the riprap, to a nominal depth of six (6) inches.

- A. Bedding material shall be spread uniformly over filter fabric material. Placement shall not commence until the DISTRICT has approved subgrade preparation and filter fabric installation.
- B. Placement methods, which segregate the bedding particles, will not be permitted.
- C. Compaction of the bedding material will not be required, but material shall be finished to a reasonably even surface.
- D. Tolerance shall be + three-tenths foot provided this tolerance is not continuous over an area greater than 200 square feet when placed in the dry, or greater than 400 square feet when placed sub aqueous.
- E. CONTRACTOR shall maintain the bedding material until the riprap is in place.

- 3.05 RIPRAP: The CONTRACTOR shall proceed placing the riprap upon completion of filter fabric and bedding material (where required) and after receiving approval of the DISTRICT to proceed. The CONTRACTOR shall place riprap in accordance with the following.

- A. Stone shall be placed in such a manner as to produce a reasonably well-graded mass with the minimum practicable percentage of voids.

1. Place to full course thickness in one operation in a manner to avoid displacing or puncturing filter fabric.
    - a. Stone shall not be dropped from a height greater than three (3) feet above the fabric.
  2. Finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Hand place or adjust if necessary to secure the desired results.
- B. Surface Tolerances:
1. Dry Installation: The finished stone surface shall not vary from design grade by more than three (3) inches at any location, except that any extreme of the tolerance shall not be continuous over an area greater than 100 square feet.

3.06 MAINTENANCE: The CONTRACTOR shall maintain the riprap until Final Completion. The CONTRACTOR shall replace riprap displaced by any cause prior to acceptance.

END OF SECTION

## SECTION 02401 DEWATERING AND COFFERDAM

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary or Work: The CONTRACTOR shall furnish all labor, material and equipment necessary for the removal of all surface and subsurface waters from excavation areas. This SECTION includes the construction of a wellpoint system used in conjunction with an open excavation or cofferdam, temporary cofferdams with steel sheet piling and bracing, or other systems as proposed by the CONTRACTOR. The WORK includes the removal of temporary sheet piling and other temporary features at the completion of the WORK.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 01530 – Temporary Barriers and Controls
  - 3. SECTION 02262 - Steel Sheet Piling
  - 4. SECTION 02435 – Turbidity Control and Monitoring

#### 1.02 APPLICABLE STANDARDS AND PUBLICATIONS:

- A. Standards or Codes: The edition of the standards of the organizations listed below in effect at the time of the advertisement for bids form a part of this specification to the extent referenced. See the various paragraphs for the specified standard. In the case of a conflict between the requirements of this SECTION and those of the listed document, the requirements of this SECTION shall prevail.
  - 1. American Society for Testing and Materials (ASTM):
    - a. A36 - Standard Specification for Carbon Structural Steel
    - b. A328 - Standard Specification for Steel Sheet Piling

#### 1.03 DEFINITIONS: (Not Used)

#### 1.04 SUBMITTALS: The CONTRACTOR shall make submittals in accordance with SECTION 01300 and the following:

- A. The CONTRACTOR shall submit to the DISTRICT a site-specific dewatering plan for regulatory approval, which includes qualifications of the design professional(s), the dewatering system and temporary cofferdam design, dewatering equipment, safety procedures, sequence of construction, and re-watering procedures, prior to the start of any such operations. The dewatering plans shall also include the items specified in Article 1.06 of this SECTION.
- B. Submit certification from a Professional Engineer registered in the State of Florida that the temporary cofferdam has been designed to meet the criteria specified herein.
- C. Two (2) sets of signed and sealed prints of the temporary cofferdam system shall be submitted to the DISTRICT.
- D. Acquire all permits required to discharge water and protect waterways from turbidity during the dewatering operation.

#### 1.05 QUALIFICATIONS:

- A. The CONTRACTOR shall demonstrate a minimum of ten (10) years experience in the construction of dewatering systems including, but not necessarily limited to, sheet pile, pumping and cofferdams.
- B. Qualifications of the dewatering system design engineer must demonstrate a minimum of ten (10) years experience doing similar work as approved by the DISTRICT and be a Professional Engineer registered in the State of Florida.

#### 1.06 RESPONSIBILITIES:

- A. This is a performance specification. Except as otherwise specified or indicated, selection of equipment, materials, and methods shall be CONTRACTOR's responsibility. The dewatering of any excavation areas and disposal of all water handled shall be in strict accordance with all local and state government rules and regulations.
- B. The CONTRACTOR shall be responsible for the design of the dewatering system including, but not necessarily limited to, the temporary cofferdam, required pump equipment, temporary shoring, as well as any miscellaneous temporary structures required.
- C. The dewatering plan shall include at a minimum:
  - 1. A site plan of the Project indicating the location of the proposed discharge point(s) with the associated water quality monitoring locations including background and compliance turbidity monitoring locations, the location and type of erosion and turbidity control devices, and the methods necessary to ensure that the state water quality standards are met.
  - 2. Calculations for estimating the area of influence of dewatering, depth of dewatering, pumping rates, duration and volumes, and the proposed method of dewatering must be submitted for review.
  - 3. A water quality monitoring plan.
- D. Unless dewatering is to occur for less than 3 months, the dewatering systems shall lower the groundwater table to a minimum of two (2) feet below the excavation and the dewatering plan shall include installation of a minimum of two (2) groundwater monitoring wells located on opposite sides of the excavation.
- E. Volume of water discharged must be reported at each Site. The CONTRACTOR shall submit, calibration data, operating ranges of the pumping equipment, and instrumentation to be used to determine flows and daily volumes pumped.
- F. ~~Two~~ If onsite ponds are designated to receive dewatering discharges. If it is anticipated that offsite discharges will occur due to construction dewatering activities, the CONTRACTOR must also include documentation that the dewatering activities will meet all regulatory criteria.
- G. The CONTRACTOR shall comply with the following conditions of the National Pollutant Discharge Eliminating System (NPDES) Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity.
  - 1. The facility is authorized to discharge produced ground water from any non-contaminated site activity which discharges by a point source to surface waters of the State, as defined in Chapter 62-620, Florida Administrative Code (F.A.C.), ONLY if the reported values for the parameters listed in Table 1 do not exceed any of the listed screening values. Before discharge of produced ground water can occur from such sites, analytical tests on samples of the proposed untreated discharge water shall be performed to determine if contamination exists.
  - 2. Minimum reporting requirements for all produced ground water dischargers: The effluent shall be sampled before the commencement of discharge, again within 30 days after commencement of discharge, and then once every six (6) months for the life of the Project to maintain continued coverage under this generic permit. Samples taken in compliance with the provisions of this permit shall be taken prior to actual discharge or mixing with the receiving waters. The effluent shall be sampled for the parameters required by permit. In addition, equipment blanks will be required and monitoring using an autosampler may be required.



1.07 CERTIFICATIONS AND TESTING:

- A. A Professional Engineer registered in the State of Florida hired by the CONTRACTOR shall inspect, accept, and certify the temporary sheet piling used for dewatering purposes.

1.08 INSPECTION COORDINATION:

- A. The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The Contractor shall provide at least 48 hours advance notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Used)

**PART 2 - PRODUCTS**

2.01 PRODUCT REQUIREMENTS:

- A. All materials used in the construction of the dewatering facilities shall be selected, furnished and installed by the CONTRACTOR in accordance with the design as submitted to the DISTRICT.

2.02 SHEET PILE:

- A. The CONTRACTOR shall provide new or used temporary sheet piling for use in the cofferdam conforming to the requirements of ASTM A328.

2.03 STRUCTURAL STEEL:

- A. The CONTRACTOR shall provide structural steel for use in the cofferdam conforming to the requirements of ASTM A36.

**PART 3 - EXECUTION**

3.01 PERFORMANCE: The CONTRACTOR shall furnish and install sheet pile cofferdams in accordance with the following.

- A. The CONTRACTOR shall retain the services of a Professional Engineer registered in the State of Florida for the design of the cofferdam system. Bracing will not be allowed to impart loads to the permanent structure. Temporary construction loads to the permanent structure in excess of those imparted during in-situ operating conditions will not be allowed. It should be noted that the sheet pile wing walls are supported by anchor rods connected to anchor walls, concrete deadmen, pilings, etc., so installation of a cofferdam shall be phased to avoid interfering with these elements or otherwise reducing their load-carrying capacity.
- B. Approximate locations of cofferdam, structural characteristics and embedment depths shall be determined by the engineer designing the cofferdam. If a temporary sheet pile cofferdam is proposed, the CONTRACTOR shall provide a sequence of construction that complies with the requirement of SECTION 02262 and does not affect the integrity of the permanent components.
- C. The layout and design of the interior and exterior bracing system for the cofferdam shall fully accommodate with appropriate factors of safety, all applied loading indicated. Those loadings may be increased if considered appropriate by the engineer designing the cofferdam.

3.02 DEWATERING:

- A. The CONTRACTOR shall provide adequate equipment for removal of storm, subsurface or cofferdam leakage waters, which may accumulate in the cofferdam interior.
- B. The CONTRACTOR shall perform all WORK for the water control structure in the cofferdam interior free from water. The CONTRACTOR shall furnish, install, maintain, and operate all necessary pumping and other equipment necessary for dewatering the WORK area.

1. All dewatering equipment shall be in first-class condition and shall at all times be maintained and operated at the efficiency and capacity necessary for maintaining the cofferdam interior free from standing water or wet conditions that may prevent proper construction.
  - C. The CONTRACTOR shall provide dewatering facilities with stand-by pumps with 100 percent standby capacity.
  - D. The CONTRACTOR shall comply with all local, state and federal regulations when disposing of water generated by dewatering operations.
- 3.03 TURBIDITY BARRIER:
- A. The CONTRACTOR shall install and maintain suitable turbidity barriers as described in SECTIONs 01530 and 02435.
- 3.04 REMOVAL OF DEWATERING SYSTEM AND COFFERDAMS:
- A. The CONTRACTOR shall remove the dewatering system in such a manner as to allow groundwater and surface water elevations to slowly return to natural elevations without causing erosion or damage to the structure or foundation.
  - B. The CONTRACTOR shall slowly flood the dewatered area to establish water surface elevations upstream of water control structure and equal to tailwater downstream of water control structure prior to removal of temporary cofferdams.
  - C. If a portion of the cofferdam is incorporated into the structure, the CONTRACTOR shall review the Drawings to determine what portion of the sheet pile of the cofferdam that shall be removed.
- 3.05 REGULATION SCHEDULE:
- A. Noise Abatement: The CONTRACTOR shall furnish, install, and maintain throughout the course of the WORK, mufflers, noise-control enclosures, or other noise control methods, measures, and features on and around all dewatering pumps and their drive units such that steady noise emanating from this equipment does not exceed the permissible sound levels defined in the local County ordinances.

END OF SECTION

**PART 1 - GENERAL****1.01 SCOPE**

- A. Summary of Work: The CONTRACTOR shall furnish and install all necessary equipment, labor, and materials to provide either pumped or gravity bypass for temporary stormwater management on an as-needed basis as specified here-in.
- B. Required Work Specified Elsewhere:
  - 1. SECTION 01050 – Field Engineering
  - 2. SECTION 01300 – Submittals
- C. The CONTRACTOR shall be responsible for obtaining and paying for all permits required for the installation of the Bypass, including but not limited to:
  - 1. United States Army Corps of Engineers (USACE)
  - 2. Florida Department of Environmental Protection (FDEP)
  - 3. Hillsborough County Environmental Protection Commission (EPC)
  - 4. Applicable Local regulatory and Building permits.
- D. The CONTRACTOR shall be responsible for all mitigation and environmental impacts caused by the installation, operation, and removal of the bypass.
- E. The CONTRACTOR shall furnish all measures and facilities to comply with federal, state, and local environmental requirements and preserve existing site conditions (i.e. prevent shoaling, erosion and degradation of the channel banks and bottom).

**1.02 APPLICABLE SUBMISSIONS:** The most current revision of the following standard specifications shall apply to the WORK of this SECTION as indicated.

- A. American National Standards Institute (ANSI)
  - 1. PTC 19.1 – Test Uncertainties, 1998 - Section 10

**1.03 SUBMITTALS:** CONTRACTOR shall construct the gravity bypass and shall provide submittals in accordance with the following bypass methods:

- A. For Pumped Bypass:
  - 1. Pumping System Plan: The CONTRACTOR shall prepare and submit to the DISTRICT a detailed plan outlining schedules, locations, elevations, equipment capacity, and materials needed for bypass pumping while maintaining construction access to the WORK area(s) and protecting against damage due to discharge flows. The plan shall include, but not be limited to:
    - a. Pump staging areas
    - b. Number, size, and types of pumps meeting the aggregate bypass capacity noted on the contract drawings.
    - c. Downstream discharge plan and downstream erosion protection measures
    - d. Schedule of installation, maintenance, and refueling of equipment
  - 2. Start up and acceptance test report.

B. For Gravity Bypass:

1. Gravity Bypass Plan: The CONTRACTOR shall prepare and submit to the DISTRICT a detailed plan outlining locations, elevations, sections, control method(s), etc. of the gravity bypass. The submittal shall be signed and sealed by a Professional Engineer licensed in the state of Florida. The plan shall include, but not limited to:
  - a. Dimensioned site plan indicating the location of the gravity bypass structure, channel, etc. with all pertinent elevations, slope, and methods to protect existing features, etc.
  - b. Section and elevation views of the control structure with all pertinent information
  - c. Sections indicating bypass channel geometry
  - d. Structural drawings of the control structure, retaining walls, etc.
  - e. Erosion protection measures including armoring used to assure that armoring is designed for the maximum velocity expected
  - f. Hydraulic analysis and report including calculations, channel flow velocities and bypass rating curve(s)

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS AND EQUIPMENT:**

A. For Pumped Bypass:

1. The CONTRACTOR shall furnish, maintain, and operate all temporary facilities such as dams, plugs, pumping equipment, conduits, channels, all necessary power, and all other labor and equipment necessary to furnish specified bypass flows around the dewatered area. Materials utilized for bypass pumping shall be appropriate for the intended use and operation. All bypass pumping systems shall include:
  - a. Minimum of two pumping units.
  - b. Pumping units shall be equally sized in terms of flow capacity, intake and discharge pipe sizes, drive unit configuration, etc. to facilitate maintenance and interchangeability/replacement of components if required.
  - c. Drive units shall be fitted with residential grade silencers.
  - d. Steel discharge piping in applications where the discharge head is less than the intake head.
  - e. Maintenance of the pumping systems shall be provided through to Substantial Completion or when the facility undergoing repair or construction is flow capable.

B. For Gravity Bypass:

1. The CONTRACTOR shall furnish, maintain, and operate all temporary facilities such as dams, plugs, channels, control structure, and all other labor and equipment necessary to furnish specified bypass flows around the dewatered area. Materials utilized for gravity bypass shall be appropriate for the intended use and operation. If used the gravity bypass shall include:
  - a. An operable or passive control structure adequate to furnish the required bypass flows.
  - b. Where applicable, boards or gates installations shall include an access platform.

## **PART 3 - EXECUTION**

### **3.01 BYPASS:**

A. For Pumped Bypass:

1. Facilities: If the CONTRACTOR's bypass includes bypass pumps, then the CONTRACTOR shall furnish all materials, labor, equipment, power, maintenance, etc. to implement a bypass pump system to divert water around the WORK area. The CONTRACTOR shall provide

protection for the entire bypass system including pumps, pipes, piping connections and ancillary equipment.

2. Start Up and Acceptance Testing: Testing of the installed pump systems shall be performed by the CONTRACTOR, witnessed, and accepted by the DISTRICT. A report documenting the testing shall be generated by the CONTRACTOR and furnished to the DISTRICT. Testing shall be scheduled and planned by the CONTRACTOR to accommodate the DISTRICT and shall be completed and accepted prior to flows through the structure being impacted by construction activities. Testing shall at a minimum include:
  - a. Each pump and drive unit shall demonstrate that it can be successfully started and stopped three consecutive times
  - b. The bypass pump system shall be run for 24 hours continuously.
  - c. Flow capacity of each pump, engine operational parameters, and head conditions at the time of testing shall be measured and recorded. The DISTRICT reserves the right to have the CONTRACTOR perform the acceptance testing multiple times if head conditions change or if a pumping unit fails to perform as required during initial acceptance testing or during operation. Typical operational parameters to be recorded shall include but not limited to the following:
    - i. Flow measurement per the CONTRACTOR's accepted bypass pumping system plan
    - ii. Drive unit engine water temperature
    - iii. Drive unit engine oil pressure
    - iv. Drive unit engine RPM
    - v. Hydraulic power unit supply and return hydraulic pressures
    - vi. Fuel level in storage tanks. Fuel tanks shall be topped off after completion of acceptance testing
    - vii. Sound levels shall be in compliance with local noise ordinances.
3. Operations: The bypass pumping system shall be operated by the CONTRACTOR in accordance with the approved submittal under this section. Flow capacity shall be maintained and run continuously 24 hours per day seven (7) days per week, from the time the facility is under construction until it is flow capable. Flow rates may vary from no-flow up to the necessary bypass capacity to protect the unfinished work.
  - a. The CONTRACTOR shall furnish staff to start, stop, and change flow rates of the bypass pumping system during a twelve (12) hour per day period, from 7:00 a.m. to 7:00p.m., seven (7) days per week from the time the pumps are placed in service until Substantial Completion or when the facility undergoing repair or construction is flow capable. The pumping system shall be configured to run unattended from 7:00 p.m. to 7:00 a.m. or the CONTRACTOR shall furnish staff to monitor the pumps continuously. Response time to operate the pumping system shall be less than 1 hour from the time of notification by the DISTRICT.
  - b. The CONTRACTOR shall include in the base bid staff to start, stop, and change flow rates of the bypass pumping system for up to five (5) unplanned events which may occur outside of the 7:00 a.m. to 7:00 p.m. time frames noted in paragraph 3.01.A.3.a. Response time to operate the pumping system shall be less than two (2) hours from the time of notification by the DISTRICT.
4. Inspection: The CONTRACTOR shall inspect the bypass pumping system daily to ensure equipment is continuously fueled/powered and working correctly. A responsible operator shall be available and on-call at all times during bypass pumping operations.

B. For Gravity Bypass:

1. Facilities: The CONTRACTOR shall furnish all materials, labor, equipment, maintenance, etc. to implement the bypass system to divert water around the WORK area. The gravity bypass

system shall provide the required bypass flows for the time periods indicated in this specification. The bypass system shall meet requirements of paragraph 1.01.C.

2. Acceptance Testing: Testing of the installed gravity bypass system shall be performed by the CONTRACTOR, witnessed, and accepted by the DISTRICT. Testing shall be scheduled and planned by the CONTRACTOR to accommodate the DISTRICT and shall be completed and accepted prior to flows through the structure being impacted by construction activities. Testing shall at a minimum include:
  - a. Demonstration of the operability of the Gravity Bypass control structure
3. Operations: The gravity bypass shall be operated by the CONTRACTOR in accordance with the approved submittal. Bypass flows shall be capable of continuous flow from the time the facility under construction until it is flow capable. Flow rates may vary from no-flow up to the necessary bypass capacity.
  - a. The CONTRACTOR shall furnish staff to operate the gravity bypass system twelve (12) hours per day, 7:00 a.m. to 7:00 p.m., seven (7) days per week from the time bypass is placed in service until Substantial Completion or when the facility undergoing repair or construction is flow capable. Response time to operate the pumping system shall be less than 1 hour from the time of notification.
  - b. The CONTRACTOR shall include in the base bid staff to start, stop, and change flow rates of the bypass for up to five (5) unplanned events which may occur outside of the 7:00 a.m. to 7:00 p.m. time frames noted in paragraph 3.01.B.3.a. Response time to operate the bypass shall be less than two (2) hours from the time of notification.
4. Removal of Gravity Bypass and Site Restoration:
  - a. All removal and site restoration activities shall be performed in dry condition.

END OF SECTION

## SECTION 02435 TURBIDITY CONTROL AND MONITORING

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all necessary equipment, labor and materials and utilize appropriate means and methods of turbidity controls necessary and sufficient to ensure that the more restrictive and protective of the following are achieved at all times: (1) all applicable State water quality standards, as prescribed in Chapter 62-302.530, Florida Administrative Code (F.A.C.), incorporated by reference, (2) all applicable environmental permit conditions, as prescribed in the permits appended to the Contract, and (3) all stormwater and erosion control shall be in accordance with the Florida Department of Environmental Protection (FDEP) Florida Stormwater Erosion and Sedimentation Control Inspector's Manual, July 2008 Edition
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 01410 – Testing and Quality Control
  - 3. SECTION 02401 – Dewatering and Cofferdam
  - 4. SECTION 02436 – Environmental Protection

#### 1.02 APPLICABLE PUBLICATIONS: The environmental protection rules and standards in the applicable sections of the Florida Administrative Code (F.A.C.) incorporated herein by reference are:

- A. <http://www.dep.state.fl.us/legal/Rules/rulelistnum.htm>.
- B. Design and Performance Standards - 62-25.025 F.A.C.
- C. Quality Assurance - 62-160 F.A.C.
- D. Surface Waters of the State - 62-301 F.A.C.
- E. Surface Water Quality Standards - 62-302 F.A.C.
- F. Generic Permits - 62-621.300(2)&(4) F.A.C.
- G. Florida Department of Environmental Protection (FDEP)
  - a. Florida Stormwater Erosion and Sedimentation Control Inspector's Manual
- H. U.S. Army Corps of Engineers (USACE)

#### 1.03 DEFINITIONS: (Not used)

#### 1.04 SUBMITTALS: The CONTRACTOR shall make submittals for the turbidity control and monitoring system in accordance with SECTION 01300 and the requirements herein.

- A. Provide details of the turbidity controls proposed.
- B. Provide proposed layout of turbidity controls and monitoring system on the site plan.
- C. Obtain monitoring data and prepare quarterly reports in accordance with Paragraph 3.03B.

#### 1.05 QUALIFICATIONS: The CONTRACTOR shall have on-site at least one (1) employee certified by the Florida Department of Environmental Protection as a Stormwater Erosion and Sedimentation Control inspector. The certification shall be submitted to the DISTRICT for review prior to the installation, inspection, maintenance, repair or replacement of any erosion or sedimentation control Best Management Practices, including but not

limited to turbidity controls. The turbidity monitoring shall be conducted according to FDEP-approved procedures.

1.06 RESPONSIBILITIES: (Not Used)

1.07 CERTIFICATIONS AND TESTING: (Not Used)

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide 48 hours advance notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Used)

## **PART 2 - PRODUCTS**

2.01 FABRIC: The CONTRACTOR shall provide fabric that is flexible and impermeable or of sufficiently fine mesh to prevent passage of suspended material through the fabric. Fabric shall provide not less than 60 inches vertical depth of barrier where existing water depths are six feet or greater. Where existing water depths are less than six feet, the fabric depth may be decreased in 12-inch increments to not less than 12 inches to conform to existing bottom depths.

2.02 FLOATS: The CONTRACTOR shall provide floats for barriers of sufficient buoyancy to prevent the top of the barrier from submerging under any water and wind conditions. If the top of the barrier becomes submerged for any reason, the CONTRACTOR shall suspend construction operations until the condition is corrected.

2.03 ANCHORS AND WEIGHTS: The CONTRACTOR shall provide and maintain an anchor system to secure the barrier in position. Attach weights to the barrier as necessary to keep the fabric at an angle to the vertical of 30 degrees or less. Fabric material shall not be attached to the canal bottom.

## **PART 3 - EXECUTION**

3.01 TURBIDITY BARRIERS:

- A. The CONTRACTOR shall install and maintain turbidity barriers as noted in the drawings and where necessary to maintain turbidity releases at or below permit compliance levels. Barriers shall be installed prior to any backfilling, clearing and grubbing, dredging, or excavation and maintained in place until construction is complete and turbidity from construction has dissipated. All barriers shall be adequately marked and appropriate signage erected to identify them as obstructions to navigation.
- B. Any rips or tears that occur in the turbidity barrier material during use shall be repaired or replaced immediately by the CONTRACTOR at its expense. Rips or tears that occur in the turbidity barrier material in use that are not repaired or replaced immediately by the CONTRACTOR will result in a suspension of excavation and/or construction operations, and shall require repairs and replacements as a prerequisite to the resumption of work.
- C. The CONTRACTOR shall keep in place and maintain all barriers until the WORK is complete (construction areas stabilized with vegetation) and turbidity levels return to background levels based on monitoring results. Upon completion of use, the CONTRACTOR shall remove the turbidity barriers and associated items to an off-site location at its own expense.
- D. The CONTRACTOR shall conduct its operations at all times in a manner that minimizes turbidity. The CONTRACTOR is required to conform to State water quality standards as prescribed in Chapter 62-302.530, F.A.C., and to meet the special requirements of any environmental permits that have been



issued.

- E. Turbidity controls shall be inspected by the CONTRACTOR every work day, after every rainfall event of 0.5 inches or greater in a 24 hour period, and after every extreme weather event that could dislodge or damage the turbidity controls, to assure that the turbidity controls remain properly installed, undamaged, and fully functional at all times.

### 3.02 EROSION CONTROL:

- A. The CONTRACTOR shall prevent and control erosion and water pollution as per Florida Department of Transportation (FDOT) Specification Sections 104-1, 2, 3, 4, 6 and 7 and FDEP regulations and permit conditions.

### 3.03 MONITORING:

- A. The CONTRACTOR shall conduct and record the results of turbidity monitoring appropriate to the conditions and at the locations, times, and frequencies specified below. An FDEP approved Turbidity Monitoring Log is attached (Appendix A) for the CONTRACTOR's use.
  - 1. Background Monitoring Location: At least 1,000 feet (or as specified in the applicable environmental permit) upstream of any construction activities that may generate turbidity within a channel or conveyance feature outside the construction area, in the middle of the channel, at mid-depth in the water column, and outside of any visible turbidity plume.
  - 2. Compliance Monitoring Location: At a point no greater than 450 feet downstream (or as specified in the applicable environmental permit) of any construction activities discharge locations that may generate turbidity, in the middle of the channel, in the densest portion of any visible plume, at mid-depth.
  - 3. Sampling Time:
    - a. During Activities or Environmental Conditions that Can Generate Construction-Related Turbidity: Water samples for turbidity measurement shall be collected beginning no sooner than one hour after and no later than two hours after construction activity commences (or as specified in the applicable environmental permit) and every four hours thereafter until the work day ends. Water samples shall be collected at the same time(s) every work day according to this schedule. Any substantial deviation from this schedule must be approved by the DISTRICT, unless otherwise compelled by force majeure, in which case, an explanation must be provided verbally as soon as possible and in writing within 48 hours of the deviation.
    - b. During Activities and Conditions That Cannot Generate Construction-Related Turbidity: Once daily at 10:00 AM or as specified in the applicable environmental permit.
  - 4. Equipment: The turbidity monitoring equipment shall meet the specifications and be calibrated, maintained, repaired, and replaced according to the methods, procedures, and frequencies set forth in Chapter 62-160, F.A.C.
  - 5. Records Management: The individual conducting the turbidity monitoring shall transcribe the readings to the approved Turbidity Log Form (Appendix A) and sign and date the form at the close of each monitoring day. The notebook containing the signed and dated daily turbidity log forms shall be accessible at the construction site during the work day.
- B. The CONTRACTOR shall submit quarterly monitoring data (turbidity Log Forms), to the DISTRICT.

Documents submitted shall contain the following information:

1. Permit number
  2. Project name
  3. Dates of sampling and analysis
  4. A statement describing the methods used in collection, handling, storage and analysis of the samples
  5. A map indicating the sampling locations
  6. A statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data.
- C. The CONTRACTOR shall submit monitoring reports that also include the following information for each sample that is taken:
1. Time of day samples taken
  2. Depth of water body
  3. Depth of sample
  4. Antecedent weather conditions
  5. Water level stage
  6. Direction of flow

#### 3.04 EXCEEDANCES OF WATER QUALITY STANDARDS

- A. If at any time, monitoring reveals the turbidity levels, at the compliance sampling station is greater than 29 NTUs above the corresponding background sample in Class I or III receiving waters or greater than 0 NTU above background samples in receiving waters classified as OFW (Outstanding Florida Waters), construction activities shall cease immediately and not resume until corrective measures have been taken and turbidity has returned to acceptable levels. Turbidity violations and corrective measures shall be documented in the monitoring reports.
- B. The CONTRACTOR must notify the DISTRICT Construction Manager and the DISTRICT's Permitting and Compliance Staff immediately who then, per the permit, must notify the permitting agency of the exceedance. If known, the CONTRACTOR may also contact the assigned Permitting and Compliance Staff for the Project directly.

END OF SECTION

## APPENDIX A

## TURBIDITY MONITORING LOG

A site map depicting sampling locations must accompany the quarterly turbidity monitoring reports

Project Name:	Permit No.:
Collector Name:	Date:

Water Observations		Weather Observations
Water Level Stages		Temperature:
Direction of Flow		Conditions:
Water Depth		

Activities Taking Place During Sampling		
Activity	Yes	No
Excavation or Filling within 50 ft of Water Body?		
Other In-Water Work? (e.g., dewatering; installing piling or forms; injecting concrete; sand blasting; painting)		
Other Activity? (e.g., materials transfer; washdown; interim stabilization)		

Background Station Data	A.M. Mid-Depth	Mid-Day Mid-Depth	P.M. Mid-Depth
Describe Location:			
Collection Time			
Analysis Time			
Turbidity (NTU)			
Analysis Date			

Compliance Station Data	A.M. Mid-Depth	Mid-Day Mid-Depth	P.M. Mid-Depth
Describe Location:			
Collection Time			
Analysis Time			
Turbidity (NTU)			
Analysis Date			
Was Compliance Sample more than 29 NTU's above Background Sample?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If the 29 NTU limitation was exceeded, please describe cause (e.g., excessive rainfall; interim stabilization failure; BMP capacity exceedance, short-circuiting, or other causes), location(s) (depicted on attached site map), and corrective actions taken describe on reverse side.			

Comments (on reverse side of this form):
--

Statement of Authenticity	
I certify this test was conducted with a calibrated device and that the results are complete and accurate. Signature:	Date:

[illegible]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

SECTION 02436 ENVIRONMENTAL PROTECTION

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall provide labor, equipment and materials for the prevention of environmental damage as the result of construction operations under this contract and for those measures set forth in other technical requirements of these specifications.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 01530 - Temporary Barriers and Controls
  - 3. SECTION 02050 – Demolition
  - 4. SECTION 02100 - Site Preparation
  - 5. SECTION 02110 – Clearing and Land Preparation
  - 6. SECTION 02114 – Tree Removal
  - 7. SECTION 02401 – Dewatering and Cofferdam
  - 8. SECTION 02402 – Bypass
  - 9. SECTION 02435 – Turbidity Control and Monitoring
  - 10. SECTION 02930 – Landscaping

1.02 APPLICABLE PUBLICATIONS: Numerous environmental laws and regulations may apply. At the federal level, the contractor shall comply with the Clean Water Act (CWA); Clean Air Act (CAA), Safe Drinking Water Act, Coastal Zone Management Act (CZMA); Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Endangered Species Act (ESA); Fish and Wildlife Coordination Act (FWCA); National Environmental Policy Act (NEPA); National Pollution Discharge Elimination System (NPDES); National Historic Preservation Act (NHPA); Native American Graves Protection and Repatriation Act (NAGPRA); Resource Conservation and Recovery Act (RCRA); Toxic Substance Control Act (TSCA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Code of Federal Regulations (CFR); Executive Orders and Environmental Protection Agency (EPA) requirements, as appropriate; and all general and specific Federal Permit Conditions as applicable. Additionally, the CONTRACTOR shall comply with state and local codes, permits, regulations and ordinances as applicable.

1.03 DEFINITIONS: For the purpose of this specification, environmental damage is defined as the presence of hazardous, physical, or biological elements or agents which alter the physical, chemical or biological integrity of the environment in such a way that it represents an unacceptable risk to public health, safety or welfare; unfavorably alter ecological balances; affect other species, biological communities, or ecosystems; or degrade the quality of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.04 SUBMITTALS: Within 20 calendar days after the Notice to Proceed, the CONTRACTOR shall submit an Environmental Protection Plan for review and acceptance by the DISTRICT. Approval of the plan shall not relieve the CONTRACTOR of its responsibility for adequate and continuing control of pollutants and appropriate environmental protection measures. Approval of the plan is conditional and predicated on satisfactory performance during construction. The DISTRICT reserves the right to require the CONTRACTOR to modify the Environmental Protection Plan if it is determined that environmental protection requirements are not being met. No physical work at the site shall begin prior to acceptance of the Environmental Protection Plan. The plan shall include, but not be limited to the following:

- A. A list of the Federal, State and Local laws, regulation and permits concerning environmental protection, pollution control and abatement that are applicable to the CONTRACTOR's proposed operations and the requirements imposed.
- B. Methods for protection of features to be preserved within the authorized WORK areas: The CONTRACTOR shall prepare a listing of methods to protect resources needing protection (trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil and historical, archeological and cultural resources).
- C. Procedures to be implemented are to provide the required environmental protection and to comply with applicable laws and regulations: The CONTRACTOR shall provide written assurance that immediate corrective action will be taken to correct any environment damage due to accident, natural causes or failure to follow the procedures set out in accordance with the Environmental Protection Plan.
- D. Environmental monitoring plans, if appropriate.
- E. Traffic control plan, if appropriate.
- F. Drawings showing locations of proposed temporary activities, such as material storage areas or stockpiles of excess spoil or materials.
- G. Erosion and sediment control methods, for protecting surface waters, wetlands, and groundwater during construction. All stormwater and erosion control methods shall be in accordance with the FDEP Florida Stormwater Erosion and Sedimentation Control Inspector's Manual, July 2008 Edition. The CONTRACTOR shall prevent and control erosion and water pollution as per FDOT Specification Sections 104-1, 2, 3, 4, 6 and 7 and Florida Department of Environmental Protection (FDEP) regulations and permit conditions.
- H. Spill Prevention Methods: The CONTRACTOR shall identify any hazardous or potentially hazardous substances to be used on the job site and indicate intended actions to prevent accidental or intentional introduction of these materials into the air, ground, water, wetlands or drainage areas. The plan shall specify the actions that will be taken to meet the federal, state and local laws regarding labeling, storage, removal, transport and disposal of all hazardous or potentially hazardous substances.
- I. Spill Contingency Plan for hazardous, toxic or petroleum material.
- J. A WORK area plan, showing proposed activities and identifying areas of limited use or non-use, and including measures that will be taken for field identification of these areas.
- K. Identification of the person who shall be responsible for implementation of the Environmental Protection Plan. This person shall have authority to respond for the CONTRACTOR in all environmental protection matters.
- L. A recycling and waste management plan. The CONTRACTOR shall include waste minimization efforts in the Plan.

#### 1.05 QUALIFICATIONS:

When the Eastern Indigo Snake is identified as a species of concern in the environmental permits the CONTRACTOR shall supply qualified eastern indigo snake observers during ground clearing activities. The observer's qualifications shall be provided to DISTRICT's Construction Manager at least two weeks prior to the commencement of ground clearing activities.

CONTRACTOR shall supply a Florida Fish and Wildlife Conservation Commission authorized gopher tortoise agent to conduct the required gopher tortoise survey and relocations. The agent's qualifications shall be provided to DISTRICT's Construction Manager at least two weeks prior to the commencement of ground clearing activities.

1.06 RESPONSIBILITIES:

- A. Quality Control: The CONTRACTOR shall establish and maintain quality control for the environmental protection of all items set forth herein. The CONTRACTOR shall record on daily quality control reports or attachments thereto, any problems in complying with laws, regulations and ordinances, and corrective action taken.
- B. Permits and Authorizations: The CONTRACTOR shall obtain all needed permits or licenses unless the DISTRICT has already acquired them. The CONTRACTOR shall be responsible for implementing the terms and requirements of all permits issued for construction of the project. The CONTRACTOR shall install speed limit signs for off-road and improved road travel for construction equipment and employee vehicles that identify speeds protective of wildlife. The CONTRACTOR shall also provide all necessary signage describing Threatened and/or Endangered species which are identified in applicable environmental permits.

1.07 CERTIFICATIONS AND TESTINGS:

All physical, chemical, and biological measurements and analyses that are necessary to comply with the monitoring requirements in all applicable permits or in this contract must be performed according to approved methods and procedures by a commercial laboratory that is certified to perform the required analyses according to the approved methods and procedures by the National Environmental Laboratory Accreditation Conference (NELAC).

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The CONTRACTOR shall provide to the District at least 48 hours advance notice of its intention to begin new WORK activities.

1.09 WARRANTY: (Not Used)

**PART 2 - ENVIRONMENTAL PROTECTION PLAN**

2.01 NOTIFICATION: In the event that the DISTRICT notifies the CONTRACTOR of any non-compliance with federal, state or local laws, permits or other elements of the CONTRACTOR's Environmental Protection Plan, the CONTRACTOR shall inform the DISTRICT of the proposed correction action and take such action as approved.

The CONTRACTOR shall notify the DISTRICT's Construction Manager immediately of any warnings or notices of noncompliance, fines, citations or tickets issued directly to the contractor by any federal, state, or local environmental protection, waste management, code enforcement, or fire, police, or public health agency.

If the CONTRACTOR fails to comply, the DISTRICT may order all WORK to cease until corrective action has been taken. No time extensions shall be granted or damages allowed for the suspension of WORK under this circumstance.

A Notice of Termination (NOT) shall be sent to the applicable federal, state, and local permit-issuing authorities with copy to the DISTRICT's Construction Manager within fourteen (14) days of final stabilization

2.02 SUMMARY: The CONTRACTOR shall submit a written report within 30 days of completion of the project. This report shall delineate the absence, or occurrence, of reported or unreported environmental incidents during the course of the project.

2.03 TRAINING: The CONTRACTOR shall train its personnel in relevant phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, and careful installation and monitoring of the project to ensure continuous environmental pollution



control. The Standard Protection Measures for the Eastern Indigo Snake dated August 12, 2013, is attached in Appendix C. Additional information provided in Appendix B.

Due to the probability that wildlife species of concern, including but not limited to Threatened and/or Endangered species and Protected Migratory Bird species may be present within or adjacent to construction sites, prior to initiation of construction activities, the CONTRACTOR(s) will be trained by the DISTRICT and/or U.S. Fish & Wildlife Service on how to identify and implement appropriate protection measures for each species.

### **PART 3 - PROTECTION OF ENVIRONMENTAL RESOURCES**

- 3.01 GENERAL: During the entire period of the Contract, the CONTRACTOR shall protect environmental resources within the project boundaries and those affected outside the limits of construction. The CONTRACTOR shall confine its activities to the areas defined by the drawings and specifications. Any deviations from the plans (borrow areas, disposal areas, staging areas, and alternate access routes) will require additional review by the DISTRICT to ensure compliance with environmental rules and regulations prior to implementation/or commencement of those deviations.
- 3.02 PROTECTION OF LAND RESOURCES: Prior to the beginning of any construction the CONTRACTOR shall identify all land resources that are to be preserved or avoided within the WORK area. The CONTRACTOR shall not remove, cut, deface, injure, or destroy any land resources (trees, shrubs, vines, grasses, topsoil, or land forms) unless indicated in the plans or specifically authorized by the DISTRICT. All damaged areas shall be restored to original or better condition.
- 3.03 DISTURBED AREAS: The CONTRACTOR shall effectively prevent erosion and control sedimentation through approved materials and methods as identified in the Environmental Protection Plan. Disturbed areas will include areas of ingress and egress, construction materials storage, staging, washdown areas, and toxic, hazardous, and solid materials/waste storage areas. Disturbed areas shall be temporarily stabilized within seven (7) days of cessation of phased construction activity and permanently stabilized within fourteen (14) days of cessation of all phases of construction activity. Temporary BMPs shall remain in place and in effect until the final site inspection is complete and construction site is certified as stabilized.
- 3.04 PROTECTION OF WATER RESOURCES: The CONTRACTOR shall conduct all activities in a manner to avoid pollution of surface and ground water and wetlands. The CONTRACTOR's construction methods shall protect wetland and surface water areas from damage due to mechanical grading, erosion, sedimentation and turbid discharges. No storage or stockpiling of equipment shall be allowed within any wetland area unless specifically authorized under permit.
- Water directly derived from construction activities shall not be allowed to directly discharge to water areas, but shall be collected in retention areas to allow settling of suspended materials. The CONTRACTOR shall monitor water quality of dewatering discharge into water bodies or leaving the site in accordance with applicable environmental permits. All monitoring of any water areas that are affected by construction activities shall be the responsibility of the CONTRACTOR.
- 3.05 OIL, FUEL AND HAZARDOUS SUBSTANCE SPILL PREVENTION: The CONTRACTOR shall prepare a spill contingency plan in accordance with 40CFR, Part 109. The CONTRACTOR shall prevent oil, fuel or other hazardous substances from entering the air, ground, drainage, and local bodies of water or wetlands. In the event that a spill occurs, despite design and procedural controls, the CONTRACTOR shall take immediate action to contain and clean up the spill and report the spill immediately to the DISTRICT and to other appropriate federal, state, and local agency contacts. Reportable quantities (> 25 gallons) of petroleum-based fluids must be reported within 1 hour to the National Response Center (800-424-8802) and State Warning Point (800-320-0519) if it reaches the waters of the state or, if not, within 24 hrs to State Warning Point. Toxic and hazardous substance spills directly into waters of the state, in any quantity, must be reported immediately to the DISTRICT and those federal and state points of contact listed above.

The CONTRACTOR shall submit a written report to the DISTRICT and to the State of Florida Bureau of Emergency Response providing certification of commitment of manpower, equipment and materials necessary to prevent the spread and effect expeditious cleanup and disposal. This report shall be submitted within 48 hours of the spill event.

- 3.06 MATERIALS AND WASTE MANAGEMENT: For sanitary waste management, the CONTRACTOR shall ensure that portable restrooms will be anchored on level ground with at least a 15-foot set-back from water bodies or banks or slopes thereto. For solid waste management, dumpster(s) will either be outfitted with a water-tight cover or be covered with a tarpaulin when not in use to minimize infiltration and leaching of rain with at least a 15-foot set-back from water bodies, conveyances thereto, or banks or slopes thereto. Hazardous materials storage areas and liquid refuse and hazardous waste collection and storage areas shall be denoted on a BMP Site Plan.

The CONTRACTOR shall ensure toxic substances and hazardous materials are stored in a locked, blast-resistant shed anchored to a bermed concrete or asphalt pad on level ground with at least a 15-foot setback from any water bodies, conveyances thereto, or banks or slopes thereto.

For solid & hazardous waste disposal involving lead-based paint, the CONTRACTOR shall ensure containers with TCLP TPb concentrations in excess of the RCRA action level will be transported by a licensed hazardous waste hauler to a licensed hazardous waste disposal facility within the time limit appropriate to the generation rate and accumulated volume of hazardous waste material. Containers with TCLP TPb concentrations less than the RCRA action level will be transported by a licensed solid waste hauler to a licensed Class I solid waste disposal facility. In either case, the contractor will obtain and transmit signed and dated copies of the transport and disposal manifests to the District's for records retention.

The CONTRACTOR is prohibited from the on-site burning of hazardous wastes (aerosol cans, oil filters, etc.). All hazardous wastes will be disposed of as required by law. Copies of relevant Material Safety Data Sheets (MSDSs) shall be appended to the Environmental Protection Plan, Safety Plan, Spill Prevention Plan, and SWPPP.

The CONTRACTOR is responsible for the materials and processes where wastes may be generated under the contracted activities. CONTRACTOR is responsible for providing the materials in order to implement the contract and is responsible for operating and maintaining any processes from which waste material may be generated.

The CONTRACTOR is deemed to be the "generator" as defined in 40 CFR 261.10 for any hazardous wastes or spill residue that is generated during the activities encompassed in this contract. It is recognized that it is the CONTRACTOR'S or a subcontractor of the CONTRACTOR whose act first causes a hazardous waste to become subject to regulation. The CONTRACTOR is a different legal entity from the owner/operator of the physical location/property where the contracted activities will be conducted. CONTRACTOR is a "person" within the meaning of Section 403.031(5), Florida Statutes.

The CONTRACTOR is responsible for compliance with applicable standards of 40 CFR 260-268 and 40 CFR 273 and 279 and state regulations which adopt or reference these federal standards.

The CONTRACTOR is responsible for the generation and retention of records associated with waste management practices and disposition. All records shall be maintained for a minimum of three years from the date of generation. All records will be made available to the District or regulatory agencies upon request.

In the event of any chemical discharges associated with CONTRACTOR'S or subcontractor's activities, CONTRACTOR will be responsible for reporting, assessment and remediation of such discharges in accordance with applicable federal, state or local regulations and/or guidelines including, but not limited to, 40 CFR 264/265, Chapter 62-770, F.A.C. and Chapter 62-780, F.A.C.

- 3.07 FISH AND WILDLIFE RESOURCE PROTECTION: The CONTRACTOR shall control and minimize interference with, disturbance to, and damage of fish and wildlife resources.

If adverse impacts occur to fish and wildlife species of concern, including but not limited to Threatened and/or Endangered Species and Protected Migratory Bird Species, the CONTRACTOR shall immediately notify the DISTRICT's Construction Manager and provide details of adverse impacts for determination of further action that may be required. Adverse impact is defined as any harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such activity. Threatened and/or Endangered species that require specific protection measures as identified in the environmental permits shall be listed in the Environmental Protection Plan.

In the event that the DISTRICT determines that an adverse impact to species of concern, including but not limited to Threatened and/or Endangered Species and Protected Migratory Bird Species occur as a result of the construction activities, the DISTRICT shall notify the Corps of Engineers and the U.S. Fish and Wildlife Service for determination of further action and possibly to determine if seasonal or daily timing restrictions on construction activities is needed.

The person designated as responsible for the Environmental Protection Plan shall be able to identify the threatened and endangered species listed in the Environmental Protection Plan; including, but not limited to, the eastern indigo snake and gopher tortoise. Any activity observed by the CONTRACTOR that may result in adverse impact to threatened or endangered species shall be reported immediately to the DISTRICT, who shall have sole authority for any WORK stoppages, creation of a buffer area, or restart of construction activities.

Any Threatened and/or Endangered species and species of concern observed at the site will be recorded and logged. The logs shall be provided to DISTRICT's Construction Manager on a bi-weekly basis. See attached Wildlife Log, Appendix A. If nesting activity is detected within and/or adjacent to the project site, the CONTRACTOR shall immediately contact DISTRICT's Construction Manager for determination of further action and possibly to determine if seasonal or daily timing restrictions on construction activities is needed.

- 3.08 ENVIRONMENTAL PROTECTION RETENTION RECORD RETENTION: The CONTRACTOR shall retain a copy of all required permits, the EPP, the SWPPP, the Spill Prevention Plan, and all associated reports, records and documentation required by these permits or the contract at the construction site or an appropriate alternative location as specified in the NOI from Notice to Proceed (NTP) through Notice of Termination (NOT). Such documentation includes but is not limited to soil disturbance and stabilization logs, inspection and corrective action logs, turbidity monitoring logs, wildlife observation logs and reports, TCLP and SPLP assay results, sanitary, solid, and hazardous waste transport and disposal manifests, spill reports, material safety data sheets, and any warnings, citations or notices of noncompliance, or fees, levees, fines or penalties. A copy of all such records shall be submitted to the DISTRICT's Construction Manager at the time of contract close-out.
- 3.09 PROTECTION OF AIR RESOURCES: The CONTRACTOR shall minimize pollution of air resources. All activities, equipment, processes and work operated or performed in accomplishing the specified construction shall be in strict accordance with the applicable air pollution standards of the State of Florida (F.S. Chapter 403 – Environmental Control and F.A.C. Section 200 – Recirculation Chiller) and all Federal emission and performance laws and standards as appropriate. This includes control of particulates, dust generated by or incidental to construction activity, burning and odors.
- 3.10 PRESERVATION AND RECOVERY OF HISTORIC, ARCHEOLOGICAL, AND CULTURAL RESOURCES: If applicable, known historic, archeological and cultural resources within the CONTRACTOR's WORK area(s) will be designated as a "sensitive environmental area" on the contract drawings or other documents. If so designated, the CONTRACTOR shall install protection for these resources and shall be responsible for their preservation during the contract's duration. The CONTRACTOR shall not distribute maps or other information on these resource locations except for distribution among the CONTRACTOR's staff with a "need to know" technical responsibility for protecting the resources.

- A. Inadvertent Discoveries: If, during or other construction activities, the CONTRACTOR observes items that may have historic or archeological value, such observations shall be reported immediately to the DISTRICT so that the appropriate staff may be notified and a determination for what, if any, additional action is needed. Examples of historic, archeological and cultural resources are bones, remains, artifacts, shell, midden, charcoal or other deposits, rocks or coral, evidences of agricultural or other human activity, alignments, and constructed features. The CONTRACTOR shall cease all activities that may result in the destruction of these resources and shall prevent CONTRACTOR'S employees from further removing, or otherwise damaging, such resources.
- B. Claims for Downtime due to Inadvertent Discoveries: Upon discovery and subsequent reporting of a possible inadvertent discovery of cultural resources, the CONTRACTOR shall seek to continue WORK well away from, or otherwise protectively avoiding, the area of interest, or in some other manner that strives to continue productive activities in keeping with the contract. Should an inadvertent discovery be of the nature that substantial impact(s) to the WORK schedule are evident; such delays shall be handled in accordance with the contract documents.

END OF SECTION

## Appendix A Wildlife Log

For Threatened and Endangered Species and Species of Concern Listed in Permit

Wood Storks Sightings, since they are so abundant, will be logged on a bi-weekly basis in coordination with Bi-weekly Construction Progress Meetings and will be reported quarterly along with other sightings.

<input type="checkbox"/> <b>Eastern Indigo Snake</b> <input type="checkbox"/> <b>Bald Eagle</b> <input type="checkbox"/> <b>Wood Stork</b> <input type="checkbox"/> <b>Florida Panther</b> <input type="checkbox"/> <b>Caracara</b> <input type="checkbox"/> <b>Gopher Tortoise</b> <input type="checkbox"/> <b>Other</b> _____	
<b>Project Name</b>	
Date of Sighting	
Time of Sighting	
Temperature	
Wind (mph)	
Weather Conditions (ex: note sky cover, raining, humid, cloudy, sunny, cool, hot, etc)	
Construction Activity Occurring	
Equipment being Used	
Condition of Animal (ex: injured, unharmed, etc)	
Behavior of Animal (ex: disoriented, aggressive, etc)	
Actions taken after sighting	
Size of Animal	
GPS Coordinates/Specific Location	
Pictures Taken (Attach pictures)	
Date this form was completed	
Observers Company/Agency	
Observers Name	Print Name:
	Signature:
Observers Contact Info	Office:
	Cell:
	Email:

# **EXAMPLE FORM** **Wildlife Log**

For Threatened and Endangered Species and Species of Concern Listed in Permit

Wood Storks Sightings, since they are so abundant, will be logged on a bi-weekly basis in coordination with Bi-weekly Construction Progress Meetings and will be reported quarterly along with other sightings.

<input checked="" type="checkbox"/> <b>Eastern Indigo Snake</b> <input type="checkbox"/> <b>Bald Eagle</b> <input type="checkbox"/> <b>Wood Stork</b> <input type="checkbox"/> <b>Florida Panther</b> <input type="checkbox"/> <b>Caracara</b> <input type="checkbox"/> <b>Gopher Tortoise</b> <input type="checkbox"/> <b>Other</b>	
<b>Project Name</b>	C-44 Reservoir
<b>Date of Sighting</b>	Tuesday, January 29, 2008
<b>Time of Sighting</b>	0900
<b>Temperature</b>	75°
<b>Wind (mph)</b>	5-10 mph
<b>Weather Conditions</b> (ex: note sky cover, raining, windy, humid, cloudy, sunny, cool, hot, etc)	Partial cloud/Sunny
<b>Construction Activity Occurring</b>	Demobilization of Construction Trailers, nothing near the area snakes were sighted
<b>Equipment being Used</b>	n/a
<b>Condition of Animal</b> (ex: injured, unharmed, etc)	Good
<b>Behavior of Animal</b> (ex: disoriented, aggressive, etc)	under a door in an abandoned citrus office
<b>Actions taken after sighting</b>	Determined sex, took photos, estimated size
<b>Size of Animal</b>	Approx 6'
<b>GPS Coordinates/Specific Location</b>	N 27 05 33.59 W 80 26 59.90 NE Corner of Project along Eastern Levee
<b>Pictures Taken (Attach pictures)</b>	Yes, attached
<b>Date this form was completed</b>	Tuesday, February 5, 2008
<b>Observers Company/Agency</b>	Land Clearing Inc.
<b>Observers Name</b>	Print Name: Signature:
<b>Observers Contact Info</b>	Office: Cell: Email:





## Appendix B

**Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.**

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

**LEGAL STATUS:** The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission.

“Taking” of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. “Take” is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of \$25,000 for civil violations and up to \$50,000 and/or imprisonment for criminal offenses, if convicted.



August 12, 2013

## **ATTENTION:**

**THREATENED EASTERN INDIGO  
SNAKES MAY BE PRESENT ON  
THIS SITE!!!**



Please read the following information provided by the U.S. Fish and Wildlife Service to become familiar with standard protection measures for the eastern indigo snake.



**IF YOU SEE A LIVE EASTERN  
INDIGO SNAKE ON THE SITE:**

- Cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site without interference.
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate U.S. Fish and Wildlife Service (USFWS) office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

**IF YOU SEE A DEAD EASTERN  
INDIGO SNAKE ON THE SITE:**

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

**USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:**

**North Florida ES Office – (904) 731-3336**  
**Panama City ES Office – (850) 769-0552**  
**South Florida ES Office – (772) 562-3909**

**DESCRIPTION:** The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

**SIMILAR SNAKES:** The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

**LIFE HISTORY:** The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

**Appendix C**  
**STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE**  
**U.S. Fish and Wildlife Service**  
**August 12, 2013**



## **ATTENTION:** **THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!**

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- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate U.S. Fish and Wildlife Service (USFWS) office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

### **IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:**

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Panama City Field Office – (850) 769-0552  
South Florida Field Office – (772) 562-3909**

#### **Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.**

<b>DESCRIPTION:</b>	The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.
<b>SIMILAR SNAKES:</b>	The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.
<b>LIFE HISTORY:</b>	The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.
<b>PROTECTION:</b>	The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of \$25,000 for civil violations and up to \$50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

August 12, 2013

**PART 1 - GENERAL**

**1.01 SUMMARY:**

- A. The WORK covered by this SECTION consists of furnishing all the necessary equipment, materials and labor associated with the establishment and maintenance of grass in all areas as specified herein and in the drawings. These include, but are not limited to, seeding and mulching and maintenance.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 02402 – Bypass
  - 2. SECTION 02920 – Sodding
  - 3. SECTION 02930 – Landscaping.

**1.02 SUBMITTALS:**

- A. Certificates:
  - 1. Seed shall be certified that they meet requirements of these specifications, stating botanical name, percentage by weight, percentage of purity, germination, and weed seed for each grass seed species.

**1.03 WARRANTY:**

- A. The CONTRACTOR shall warrant the WORK against defects for one (1) year from the date of Final Completion and as described in the contract documents.

**PART 2 - MATERIALS:**

**2.01 GRASS SEED:**

- A. Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America and as required below.
- B. Seed shall be labeled according to the U.S. Department of Agriculture Federal Seed Act and shall be furnished in containers with tags showing seed mixture, purity, germination, weed content, name of seller, and date on which seed was tested.
  - 1. Seed Mixtures: Meet the following minimum weight of pure live seed per acre:

Seed Name	Pounds Pure Live Seed
Argentine Bahia	41
Seashore Paspalum	50
Brown Top Millet	21
Native Seed Mix	10-16 (TBD by species composition)

NOTE: Pure live seed (PLS) is determined by multiplying the % pure seed by the % germination. Therefore, if the pure seed is 80% and the germination is 70% the PLS is .80 X .70 or 56%. At 56% it would take 53.5 pounds to equal 30 pounds of PLS.

- 2. Moldy seed or seed that has been damaged in storage will not be accepted.
- 3. When seasonal conditions mandate, substitute a winter grass such as rye grass for the brown top millet.

2.02 FERTILIZER: Not Used

2.03 MULCH: Not Used

### **PART 3 - EXECUTION**

#### **3.01 SOIL PREPARATION:**

- A. Any growth, rocks, or other obstructions which might interfere with tilling, seeding, or later maintenance operations shall be removed and disposed of properly. Remove stones over two (2) inches in any dimension and sticks, roots, rubbish and other extraneous matter.
- B. Areas to be seeded are to be graded to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges and fill depressions, to meet finish grades. Limit fine grading to areas which can be planted within immediate future.
- C. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting.
- D. If prepared areas are eroded or otherwise disturbed after fine grading and prior to planting they shall be restored to specified condition prior to planting.
- E. Immediately upon completion of construction, grass shall be planted in disturbed areas only as designated in the drawings. Method of planting shall be either hydroseeding or dry seeding.

#### **3.02 FERTILIZING: Not Used**

#### **3.03 SEEDING:**

- A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- B. Do not seed when wind velocity exceeds five (5) miles per hour. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
- C. Sow not less than a rate of 76 pounds of pure live seed per acre.
- D. Rake seed lightly into top 1/8-inch of soil, roll lightly, and water with fine spray.
- E. Methods of Application:
  - 1. Dry Seeding: Spreader or seeding machine.

#### **3.04 MAINTENANCE:**

- A. Perform maintenance until eight (8) weeks after all areas have been seeded.
- B. Requirements:
  - 1. The CONTRACTOR shall water all newly grassed areas a minimum of once a week until satisfactory grass growth is attained.
  - 2. Repair any portion of the seeded surface which becomes gullied or otherwise damaged, or the seeding becomes damaged or destroyed.
  - 3. Replace mulch when washed or blown away.
- C. If, at the end of the 8-week maintenance period, a satisfactory stand of grass has not been produced, renovate and reseed the grass or unsatisfactory portions thereof immediately.

#### **3.05 ACCEPTANCE OF GRASSING:**

- A. When grassing work is substantially completed, including maintenance, the DISTRICT will, upon request, make an inspection to determine acceptability.
  - 1. Seeded areas may be inspected for acceptance in parts agreeable to the DISTRICT, provided WORK offered for inspection is complete, including maintenance.
- B. Replant rejected WORK and continue specified maintenance until reinspected by the DISTRICT and found to be acceptable.
  - 1. A satisfactory stand is defined as a grass or section of grass that has:
    - a. No bare spots larger than three (3) square feet.
    - b. Not more than five (5) percent of total area with bare spots larger than six (6) inches.
    - c. Not more than ten (10) percent of total area with bare spots larger than two (2) inches square.
  - 2. If the grassing is still unsatisfactory upon inspection of replanted area, the CONTRACTOR shall sod those areas that are unacceptable. Acceptance of the sodded areas is dependent upon satisfactory coverage criteria established in 3.06.B.1 above.

END OF SECTION

## SECTION 02778 GEOTEXTILES

### PART 1 - GENERAL

#### 1.01 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
  - 1. ASTM INTERNATIONAL (ASTM)
    - a. ASTM D 4354 (1999; R 2009) Sampling of Geosynthetics for Testing
    - b. ASTM D 4355 (2007) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
    - c. ASTM D 4491 (1999a; R 2009) Water Permeability of
    - d. Geotextiles by Permittivity
    - e. ASTM D 4533 (2004; R 2009) Trapezoid Tearing Strength of Geotextiles
    - f. ASTM D 4632 (2008) Grab Breaking Load and Elongation of Geotextiles
    - g. ASTM D 4751 (2004) Determining Apparent Opening Size of a Geotextile
    - h. ASTM D 4759 (2002; R 2007) Determining the Specification Conformance of Geosynthetics
    - i. ASTM D 4833 (2007) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
    - j. ASTM D 4873 (2002; R 2009) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

#### 1.02 RELATED WORK REFERENCED ELSEWHERE:

- A. SECTION 02370 – RipRap System
- B. SECTION 02779 – Cellular Confinement System

#### 1.03 SUBMITTALS

- A. Submit the following in accordance with SECTION 01300 SUBMITTALS:
  - 1. Product Data:
    - a. Thread; A minimum of 30 days prior to scheduled use, proposed thread type for sewn seams along with data sheets showing the physical properties of the thread.
    - b. Manufacturing Quality Control Sampling and Testing; : A minimum of 30 days prior to scheduled use, MANUFACTURER'S quality control manual.
  - 2. Samples
    - a. Quality Assurance Samples and Tests; : Samples for quality assurance testing; assign 30 days in the schedule to allow for testing.
  - 3. Certificates
    - a. Geotextile: A minimum of 30 days prior to scheduled use, MANUFACTURER'S certificate of compliance stating that the geotextile meets the requirements of this Specification. Furnish, in duplicate, MANUFACTURER'S certified test results demonstrating that actual test results are in compliance with these Specifications. For needle-punched geotextiles, the MANUFACTURER shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles, which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile MANUFACTURER.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle geotextile in accordance with ASTM D 4873.
1. Delivery: Notify the DISTRICT a minimum of 24 hours prior to delivery and unloading of geotextile rolls packaged in an opaque, waterproof, protective plastic wrapping. The plastic wrapping shall not be removed until deployment. If quality assurance samples are collected, immediately rewrap rolls with the plastic wrapping. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced, as directed. Label each roll with the MANUFACTURER'S name, geotextile type, roll number, roll dimensions (length, width, gross weight), and date manufactured.
  2. Storage: Protect rolls of geotextile from construction equipment, chemicals, sparks and flames, temperatures in excess of 140 degrees F, direct sunlight, ultraviolet rays, or any other environmental condition that may damage the physical properties of the geotextile. To protect geotextile from becoming saturated, either elevate rolls off the ground or place them on a sacrificial sheet of plastic in an area where water will not accumulate. To the extent possible, the geotextile should remain completely wrapped in its protective covering prior to deployment.
  3. Handling: Handle and unload geotextile rolls with load carrying straps, a forklift with a stinger bar, or an axial bar assembly. Rolls shall not be dragged along the ground, lifted by one end, or dropped to the ground.

#### 1.05 WARRANTY

- A. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Final Completion and as described in the contract documents.

### PART 2 - PRODUCTS

#### 2.01 GEOTEXTILE

- A. The CONTRACTOR shall provide Type D-2 geotextile (filter) fabric conforming to the requirements of FDOT Section 985-4.1.1 for drainage applications associated with Rubble Rip Rap and Cellular Confinement Systems.

#### 2.02 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

The MANUFACTURER is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of this Specification. Documentation describing the quality control program shall be made available upon request. Perform manufacturing quality control sampling and testing in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly sampled for testing in accordance with ASTM D 354, Procedure A. Acceptance of geotextile shall be in accordance with ASTM D 4759. Tests not meeting the specified requirements will result in the rejection of applicable rolls.

#### 2.03 ANCHORING DEVICES

The Contractor shall furnish metal pins with a minimum length of 24 inches and equipped with 1.5-inch diameter steel washers located at the head of the pins. Pins shall be installed in accordance with the MANUFACTURER'S recommendations and on a pattern of 2 pins per square yard. Pins shall be installed at a spacing of 3 feet along seams. The pins shall serve to anchor the geotextile to the properly prepared and graded river bank and levee embankment slopes during inclement weather or if anchorage cannot be provided by means of an anchor trench constructed at the top of bank or along the crest of the embankment.



## PHYSICAL PROPERTIES

Component	Physical Properties
Metal Pin	0.2 in diameter steel
Metal Washer	1.5 in. diameter

### PART 3 - EXECUTION

#### 3.01 QUALITY ASSURANCE SAMPLES AND TESTS

##### A. Quality Assurance Samples

Collect samples upon delivery to the site in the presence of the DISTRICT in accordance with ASTM D 4354, Procedure B at a frequency of one per 1,000 square feet with a minimum of one (1) test at each dam abutment. Identify samples with a waterproof marker including MANUFACTURER'S name, product identification, lot number, roll number, and machine direction. The date and sample number shall also be noted on the sample. Discard the outer layer of the geotextile roll prior to sampling a roll. Samples shall then be collected by cutting the full-width of the geotextile sheet a minimum of 3 feet long in the machine direction. Rolls, which are sampled, shall be immediately resealed in their protective covering.

##### B. Quality Assurance Tests

The CONTRACTOR shall provide quality assurance samples to an Independent Laboratory for conformance testing. Samples will be tested to verify that geotextile meets the requirements specified in Table 1. Test method ASTM D 4355 shall not be performed on the collected samples. Geotextile product acceptance shall be based on ASTM D 4759. Tests not meeting the specified requirements will result in the rejection of applicable rolls.

#### 3.02 INSTALLATION

##### A. Subgrade Preparation and Anchor Trenches

The surface underlying the geotextile shall be smooth and free of ruts or protrusions, which could damage the geotextile. Subgrade materials and compaction requirements shall be in accordance with SECTION 02200. Backfill anchor trenches in accordance with SECTIONS 02200 and 02220.

##### B. Surface Preparation

The receiving embankment slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the receiving slope and the geotextile. All slope deformities, ruts, rills, and gullies resulting from traffic, precipitation runoff, groundwater seepage, or any other cause shall be corrected prior to installation of the geotextile. No holes, "pockmarks", slope board teeth marks, footprints, or other voids greater than 0.5 inches in depth normal to the receiving face shall be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 12 inches in any direction shall be permitted. Where such areas are evident, they shall be remedied by placing the proper embankment fill in accordance with the Drawings and Specifications.

##### C. Placement

Notify the DISTRICT a minimum of 24 hours prior to installation of geotextile. Geotextile rolls, which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. On slopes steeper than 10 horizontal on 1 vertical, lay the geotextile with the machine direction of the fabric parallel to the slope direction.

### 3.03 OVERLAP SEAMS

Continuously overlap geotextile panels a minimum of 24 inches at all transverse and longitudinal joints. The geotextile shall extend at least 12 inches beyond the top and bottom of the overlying revetment system. Where seams must be oriented across the slope, lap the upper panel over the lower panel. Direction of adjacent section overlap shall be in the same direction as channel flow (i.e., overlapping section shall be located upstream from underlying section). If approved, sewn seams may be used instead of overlapped seams.

### 3.04 PROTECTION

Protect the geotextile during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Use adequate ballast (e.g. sand bags) to prevent uplift by wind. The geotextile shall not be left uncovered for more than 14 days after installation.

### 3.05 REPAIRS

Repair torn or damaged geotextile. Clogged areas of geotextile shall be removed. Perform repairs by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 36 inches beyond the edge of the damaged area in all directions. Patches shall be continuously fastened using approved methods. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Remove and replace geotextile rolls, which cannot be repaired. Repairs shall be performed at no additional cost to the DISTRICT.

### 3.06 PENETRATIONS

Construct engineered penetrations of the geotextile by methods recommended by the geotextile MANUFACTURER.

### 3.07 COVER MATERIAL (SLOPE REVETMENT)

Do not cover geotextile prior to inspection and approval by the DISTRICT. Place cover material in a manner that prevents it from entering the geotextile overlap zone, prevents tensile stress from being mobilized in the geotextile, and prevents wrinkles from folding over onto themselves. On side slopes, cover material shall be placed from the bottom of the slope upward. Cover material shall not be dropped onto the geotextile from a height greater than 1 foot. No equipment shall be operated directly on top of the geotextile. Use equipment with ground pressures less than 7 psi to place the cover material over the geotextile.

The thickness of the cover material to be placed on the geotextile is shown on the Drawings. Equipment placing cover material shall not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding 5 mph.

END OF SECTION

## SECTION 02779 CELLULAR CONFINEMENT SYSTEM

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Work Included: This Section includes providing all material, labor, tools and equipment for installation of Cellular Confinement System as shown in the Contract Documents and as specified in this Section.
- B. The Cellular Confinement System shall be used for load support, channel lining, and slope protection.

#### 1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO M 218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.
  - 2. AASHTO M 288 - Geotextile Specification for Highway Applications
- B. American Society of Testing and Materials (ASTM)
  - 1. ASTM D 1505 - Density of Plastics by the Density-Gradient Technique.
  - 2. ASTM D 1603 - Standard Test for Carbon Black in Olefin Plastics
  - 3. ASTM D 1693 - Environmental Stress-Cracking of Ethylene Plastics.
  - 4. ASTM D 5199 - Measuring Nominal Thickness of Geotextiles and Geomembranes.
  - 5. ASTM E 41 - Terminology Relating to Conditioning.

#### 1.03 SUBMITTALS

- A. Submit Manufacturer's shop drawings in accordance with Section 01300, including Manufacturer's product data, samples and section layout.
- B. Manufacturer's Certificate of Analysis: Manufacturer shall supply certificate of analysis containing the following test results for the cellular confinement material used for project: Base Resin Lot Number(s), Resin Density per ASTM-1505, Production Lot Number(s), Material Thickness, Short Term Seam Peel Strength, and percentage of Carbon Black.
- C. No material will be considered as an equivalent to the Geoweb material specified herein unless it meets all requirements of this specification, without exception. Manufacturers seeking to supply what they represent as equivalent material must submit records, data, independent test results, samples, certifications, and documentation deemed necessary by the Engineer to prove equivalency. The Engineer shall approve or disapprove other Manufacturers materials in accordance with the General Conditions after all information is submitted and reviewed. Any substitute materials submitted shall be subject to independent lab testing at the Contractor's expense.

#### 1.04 QUALITY ASSURANCE AND CONTROL

- A. The cellular confinement system material shall be provided from a single Manufacturer for the entire project.
- B. The Manufacturer's Quality management system shall be certified and in accordance with ISO 9001:2015 and CE certification. Any substitute materials submitted shall provide a certification that their cellular confinement manufacturing process is part of an ISO program and a certification will be required specifically stating that their testing facility is certified and in accordance with ISO. An ISO certification for the substitute material will not be acceptable unless it is proven it pertains specifically to the Geoweb manufacturing operations.
- C. The Manufacturer shall provide certification of compliance to all applicable testing procedures and related specifications upon the customer's written request. Request for certification shall be submitted no later than the date of order placement.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and Manufacturer.
- B. The materials shall be stored in accordance with Manufacturer's instructions. The materials shall be protected from damage and out of direct sunlight.
- C. The materials shall be delivered, unloaded and installed in a manner to prevent damage.

#### 1.06 WARRANTY

- A. The Manufacturer shall warrant each Geoweb section that it ships to be free from defects in materials and workmanship at the time of manufacture. The Manufacturer's exclusive liability under this warranty or otherwise will be to furnish without charge to the original f.o.b. point a replacement for any section which proves to be defective under normal use and service during the 10-year period which begins on the date of shipment. The Manufacturer reserves the right to inspect any allegedly defective section in order to verify the defect and ascertain its cause.
- B. This warranty shall not cover defects attributable to causes or occurrences beyond the Manufacturer's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration or improper application.

### PART 2 - PRODUCTS

#### 2.01 EXAMPLE OF ACCEPTABLE MANUFACTURER

- A. Presto Geosystems, PO Box 2399, Appleton, Wisconsin 54912 2399.  
Toll Free (800) 548 3424. Phone (920) 738 1328. Fax (920) 738 1222.  
E Mail: [info@prestogeo.com](mailto:info@prestogeo.com) Website: [www.prestogeo.com](http://www.prestogeo.com)

#### 2.02.1 GEOWEB CELLULAR CONFINEMENT SYSTEM

- A. Manufacturing Certification
  - 1. The manufacturer shall have earned a certificate of registration, which demonstrates that its quality-management system for its Geoweb cellular confinement system is currently registered to the ISO 9001:2008 and CE quality standards.
- B. Base Materials
  - 1. Polyethylene Stabilized with Carbon Black
    - a) Density shall be 58.4 to 60.2 lbs/ft<sup>3</sup> (0.935 to 0.965 g/cm<sup>3</sup>) in accordance with ASTM D 1505.
    - b) Environmental Stress Crack Resistance (ESCR) shall be 5000 hours in accordance with ASTM D 1693.
    - c) Ultra-Violet light stabilization with carbon black.
    - d) Carbon Black content shall be 1.5 to 2 percent by weight, through addition of a carrier with certified carbon black content.
    - e) Carbon black shall be homogeneously distributed throughout material.
    - f) The manufacturer must have an in-place quality control to prevent irregularities in strip material.
- C. Cell Properties
  - 1. Individual cells shall be uniform in shape and size when expanded.
  - 2. Individual cell dimensions (nominal) shall be plus or minus 10%.
  - 3. Presto Geosystems GW30V6-Cell or equivalent

- a) Length shall nominally be 11.3 inches.
  - b) Width shall nominally be 12.6 inches.
  - c) Nominal area shall be 71.3 in<sup>2</sup> plus or minus 4%.
- 4. Nominal cell depth shall be 6 inches
- D. Strip Properties and Assembly
  - 1. Perforated Textured Strip/Cell
    - a) Strip sheet thickness shall be 50 mils (1.27 mm), minus 5 percent, plus 10 percent in accordance with ASTM D 5199. Determine thickness flat, before surface disruption.
    - b) Polyethylene strips shall be textured surface with a multitude of rhomboidal (diamond shape) indentations.
    - c) Textured sheet thickness shall be 60 mils, plus or minus 6 mils (1.52 mm plus or minus 0.15 mm).
    - d) Indentation surface density shall be 140 to 200 per in<sup>2</sup> (22 to 31 per cm<sup>2</sup>).
    - e) Perforated with horizontal rows of 0.4-inch (10 mm) diameter holes.
    - f) Perforations within each row shall be 0.75 inches (19 mm) on-center.
    - g) Horizontal rows shall be staggered and separated 0.50 inches (12 mm) relative to hole centers.
    - h) Edge of strip to nearest edge of perforation shall be a minimum of 0.3 inches (8 mm).
    - i) Centerline of spot weld to nearest edge of perforation shall be a minimum of 0.7 inches (18 mm).
    - j) A slot with a dimension of 3/8-inch x 1-3/8 inch (10 mm x 35 mm) is standard in the center of the non-perforated areas and at the center of each weld.
  - 2. Assembly of Cell Sections
    - a) Fabricate using strips of sheet polyethylene each with a length of 142 inches (3.61 m) and a width equal to cell depth.
    - b) Connect strips using full depth ultrasonic spot-welds aligned perpendicular to longitudinal axis of strip.
    - c) Ultrasonic weld melt-pool width shall be 1.0-inch (25 mm) maximum.
    - d) Weld spacing for GW30V-cell sections shall be 17.5 inches plus or minus 0.10 inch (445 mm plus or minus 2.5 mm).
- E. Cell Seam Strength Tests
  - 1. Minimum seam strengths are required by design and shall be reported in test results. Materials submitted with average or typical values will not be accepted. Written certification of minimum strengths must be supplied to the Engineer at the time of submittals.
  - 2. Short-Term Seam Peel-Strength Test
    - a) Cell seam strength shall be uniform over full depth of cell.
    - b) Minimum seam peel strength shall be 480 lbf (2,130 N) for 6-inch (150 mm) depth.
  - 3. Long-Term Seam Peel-Strength Test
    - a) Conditions: Minimum of 7 days in a temperature-controlled environment that undergoes change on a 1-hour cycle from room temperature to 130 degrees F (54 degrees C).
    - b) Room temperature shall be in accordance with ASTM E41.

- c) Test samples shall consist of two, 4 inch (100 mm) wide strips welded together.
- d) Test sample consisting of 2 carbon black stabilized strips shall support a 160-pound (72.5 kg) load for test period.

## 2.03 INTEGRAL COMPONENTS

### A. Geoweb Panel Connections

- 1. Panel keys shall be constructed of polyethylene and provide a high strength connection with minimum pull-through of 275 lbs (125 kg).
- 2. Panel keys shall be used to connect Geoweb panels together at each interleaf and end to end connection.
- 3. Presto Atra Keys or equivalent to be installed per manufacturer's instruction.

## 2.04 STAKE ANCHORAGE

### A. Glass Fiber Reinforced Polymer (GFRP) Anchors

- 1. GFRP Anchors shall be pre-assembled units consisting of the ATRA Clip inserted onto ATRA GFRP stake, or manufacturer's equivalent.
- 2. The glass reinforcement content shall be 75% minimum by weight and shall be continuous longitudinal filament.
- 3. Polymer shall be vinyl ester, isophthalic polyester, or another matrix material.
- 4. The outer surface shall be sand coated and deformed by a helical wrap of glass.
- 5. The minimum compressive strength shall be 95 kips (655 MPa) in accordance with ASTM D 638.
- 6. The stake shall be non-magnetic, non-conducting and corrosion resistant.
- 7. The stake length shall be at least 18 inches.

## 2.05 CELL INFILL MATERIALS

- A. Cell infill material shall be crushed aggregate with a maximum particle size of 2 inches (75 mm) with a fine content of less than 10%.
- B. Infill material shall be free of any foreign material.
- C. Clays, silts and organics are not acceptable infill material.
- D. Infill material shall be free-flowing when placed in the Geoweb sections.

## 2.06 ADDITIONAL COMPONENTS

### A. Subbase Materials

- 1. The subbase material shall be random backfill graded and compacted to be firm and unyielding, to the extent that it will support grading equipment.

### B. Surface Wearing Course

- 1. The surface wearing course shall be the same material as the cell infill in section 2.5.
- 2. The wearing course shall be a minimum of 2 inches thick above the infill surface.

### C. Surface Wearing Course

- 1. The surface wearing course shall be the same material as the cell infill in section 2.5.
- 2. The wearing course shall be a minimum of 2 inches thick above the infill surface.

### D. Filter Fabric

1. The CONTRACTOR Shall provide geotextile (filter) fabric conforming to the requirements of FDOT Section 985-4.1.1 for drainage applications.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify site conditions are as indicated on the drawings. Notify the Engineer if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.
- B. Verify layout of structure is as indicated on the drawings. Notify the Engineer if layout of structure is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

#### **3.02 INSTALLATION OF LOAD SUPPORT SYSTEMS**

- A. Prepare subgrade and install the Geoweb load support system in accordance with Manufacturer's instructions.
- B. Subgrade Preparation
  1. Excavate and shape foundation soils as indicated on the drawings.
  2. Ensure foundation soil meets minimum strength requirements through proof rolling or other conventional method and is approved by the Engineer. If unacceptable foundation soils are encountered, excavate and replace with suitable quality material as directed by the Engineer.
- C. Sub Base Preparation and Installation
  1. Ensure that the subgrade soil meets the minimum strength requirements for installation of the subbase.
  2. Place additional subbase materials to the required depth as specified in the Contract Documents.
  3. Compact to a minimum 95 percent Standard Proctor.
- D. Geoweb Section Placement and Connection
  1. Place Geoweb sections and verify all sections are expanded uniformly to required dimensions and that outer cells of each section are correctly aligned. Interleaf or overlap edges of adjacent sections. Ensure upper surfaces of adjoining Geoweb sections are flush at joint and adjoining cells are fully aligned at the cell wall slot.
  2. Connect the Geoweb sections with manufacturer's approved panel keys at each interleaf and end to end connection. Insert the key through the cell wall slot before inserting through the adjacent cell, or as specified by manufacturer. Turn the ATRA key 90 degrees to lock the panels together, or as specified by the manufacturer.
- E. Anchorage with GFRP Anchors
  1. Position collapsed Geoweb sections in place and partially drive ATRA GFRP Anchors in the outer edge cells and expand sections into place, or as required by the manufacturer. Partially drive ATRA Anchors in the perimeter cells to keep sections fully expanded, or as required by the manufacturer.
  2. With Geoweb sections fully expanded, drive ATRA GFRP Anchors so the arm of the ATRA Clip is through the internal slots in the Geoweb cell wall and anchors do not protrude over the top of the cell wall, or as required by the manufacturer.
  3. Anchorage pattern shall be as indicated by the manufacturer. Stakes shall be a minimum of 18 inches long.
- F. Crushed Aggregate Infill Placement

1. Place the specified aggregate infill with suitable material handling equipment.
  2. Infill material shall be free-flowing when placed in the Geoweb sections.
  3. Overfill cells with aggregate infill material. Limit the drop height of infill material to 3 feet (1 meter) to avoid damage or displacement of the cell wall.
  4. Level surface approximately 2 inches (50 mm) above cell walls. Maintain the 2-inch wear surface over the Geoweb sections to prevent damage to the cell walls.
  5. Compact infill to a minimum of 95 percent Standard Proctor.
  6. Shape compacted surface to required elevation as indicated on the drawings.
- G. Base Stabilization Wearing Surface
1. Ensure a minimum 2 in (50 mm) overfill is placed and compacted over the Geoweb sections prior to placing the wearing surface.
  2. The wearing surface shall be at least 2 inches thick.



## SECTION 02900 PLANTINGS

### PART 1 - GENERAL

#### 1.01 SCOPE:

- A. This section generally defines CONTRACTOR'S responsibilities, unless otherwise indicated, for the following:
  - 1. Install upland and wetland plantings as indicated in the Contract Documents
  - 2. Establishment
  - 3. Maintenance
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 02486 - Grassing
  - 2. SECTION 02920 - Sodding
  - 3. SECTION 02930 – Landscaping
  - 4. SECTION 02940 – Non-Native Vegetation Removal and Control
- C. Upon completion of the last day of the planting operation, the plant establishment period for maintaining installed plant material in a healthy growing condition shall commence and shall be in effect for 90 days; healthy plant survivorship must be at least 90% survivorship per plant species for 90 days. Written calendar time period shall be furnished for the plant establishment period. Plants will be provided supplementary watering as necessary to insure the plant's survival during the 90-day establishment period.

#### 1.02 REFERENCES:

- A. FDOT - Florida Department of Transportation - Standard Specifications for Road and Bridge – 2004 (Section 575)
- B. Integrated Management of Non-Native Plants in Natural Areas of Florida, Stephen F. Enloe, Ken Langeland, Jason Ferrell, Brent Sellers, and Greg MacDonald, IFAS Extension, University of Florida.
- C. American Standard for Nursery Stock (ASNS).
- D. Standard Methods of the Association of Official Agricultural Chemists.
- E. Federal Specifications (FS): A-A-2671, Agricultural Seeds.
- F. United States Department of Agriculture, (USDA): Federal Seed Act.
- G. Florida Pesticides Laws and Rules, Chapter 487, Florida Statutes, Florida Department of Agriculture and Consumer Services, June 1986.

#### 1.03 SUBMITTALS:

- A. Submit product technical data in accordance with Section 01300 and the following requirements.
  - 1. Delivery Schedule.
  - 2. Acknowledgement that products submitted meet requirements of standards referenced.

3. Prior to delivery of materials, certificates of compliance attesting that materials meet specific requirements. Certified copies of the material certificates shall include the classification, botanical name, common name, size, quantity by species, and locations where grown.
4. Manufacturer's installation instructions.
5. Maintenance record.

1.04 QUALITY ASSURANCE:

- A. The DISTRICT reserves the right to test, reject or approve all materials before application.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.
- B. Comply with Referenced Documents and recommendations for delivery storage and handling of herbicides.
- C. Plant Materials:
  1. Protection during delivery: Plant material shall be protected during delivery to prevent desiccation and damage to the root system, or earth ball.
  2. Inspection: Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun scald injury, disfigurement or abrasion. Prior to installation, plant material shall be checked by the Engineer of Record or authorized representative for unauthorized substitution and to establish nursery-grown status. Plant material that measures less than specified, shall be rejected. Container-grown plant material shall show new fibrous roots and the root mass shall contain its shape when removed from the container. Bare-root plant material that is dormant or is showing that roots were pulled from the ground shall be rejected.
  3. Storage: Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 24 hours. Plant material shall be protected from direct exposure to wind and sun. All plant material shall be kept in a moist condition until installed by watering in a manner acceptable to the Engineer of Record or authorized representative.
- D. The CONTRACTOR shall furnish the DISTRICT invoices of all materials received in order that the minimum application rate of materials may be determined.

1.06 SEQUENCING AND SCHEDULING:

- A. Installation Schedule:
  1. Provide schedule showing when plant materials are anticipated to be planted.
  2. Indicate planting schedules in relation to schedule for finish grading and top soiling.
  3. Indicate anticipated dates Engineer of Record or authorized representative will be required to review installation for initial acceptance and final acceptance.

1.07 SPECIAL PROJECT WARRANTY:

- A. Furnished plant material shall have a warranty for plant growth to be in a vigorous growing condition for the ninety (90) day establishment period subsequent to the completion of plant installation and acceptance by the DISTRICT; healthy plant survivorship must be at least 90% survivorship for 90 days per plant species. When plant material is determined to be unhealthy in accordance with paragraph 3.03.B.2.b, it shall be replaced under this warranty.

- B. Remove and replace plants found to be dead or in unhealthy condition for plant percentages in excess of the allowable 10% per species during the ninety (90) day establishment period.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS:**

#### **A. Plants:**

1. See plant list on Drawings.
2. Sound, healthy vigorous, with normal top and root systems, free from disease, insect pests or their eggs, grown in same climatic zone as project. For marsh and transitional grasses, all units must have at least 2-3 culms per unit.
3. All plant species are to be nursery grown Florida Grade No. 1 or equivalent as given in Grades and Standards for Nursery Plants and Trees, latest edition (FDAC), and subject to the permit conditions.
4. The SWIM Program has and will continue to advocate ecological conservatism concerning the known introduction of plant materials from ecosystems far removed from Tampa Bay. As such, all native coastal plant species requested here will have their seed or stock plants originating from the west central coast of Florida, within a fifty (50) mile radius of the project site.
5. Container grown plants (CG): roots well established in soil, grown in container for at least one growing season.
6. A minimum of two plants of each species must be shipped with tags stating the botanical nomenclature and common name. Should discrepancies arise between nomenclatures, the botanical name will prevail as to the plant identification.
7. CONTRACTOR will provide all other materials necessary to install and maintain survival of at least 90% per plant species of the planted material for the 90-day warranty period.

#### **B. Water:**

1. Clean, fresh, and free of substances or matter which could inhibit vigorous plant growth.

### **2.02 FERTILIZING: Not Used**

## **PART 3 - EXECUTION:**

### **3.01 SOIL PREPARATION**

#### **A. General**

1. Limit preparation to areas that will be planted soon after.
  2. Provide facilities to protect and safeguard all persons on or about premises.
  3. Verify location and existence of all underground utilities. Take necessary precaution to protect existing utilities from damage due to construction activity. Repair all damages to utility items at CONTRACTOR's sole expense.
- B. Provide facilities such as protective fences and/or watchmen to protect work from vandalism. CONTRACTOR will be responsible for vandalism until acceptance of work in whole or in part.

### **3.02 PLANTING GROUND COVERS**

#### **A. Notification:**

Notify DISTRICT Project Manager of source of plants and plant materials at least 30 days prior to planting to permit DISTRICT'S Project Manager or duly authorized representative to inspect source qualifications.

B. Preparation:

1. Handle plants so that roots or balls are adequately protected from breakage of balls, from sun or drying winds. Ensure Tops or roots of plants are not permitted to dry out.
2. During transportation, protect materials from wind and sun to prevent tops and roots from drying out.
3. Protect tops of plants from damage. Plans with damaged tops will be rejected.
4. Do not prune trees and shrubs at nursery.

C. Planting Season:

1. Plant any time the ground and moisture conditions are suitable.

D. Planting Procedure:

1. Plant installation shall not begin until planting areas have been staked by planting zones and are accepted by the Engineer of Record or authorized representative. Upland plants shall be installed no later than twenty-four (24) hours after delivery to the site or provisions shall be made for keeping them shaded and watered in a manner acceptable to the Engineer of Record or authorized representative.
2. Material shall be installed at the soil/sediment depths at which it was originally grown.
3. Furnish and apply all other material including water and such accessory items as may be required to facilitate the planting and establishment of all upland plants specified to be installed.
4. Indicate locations of plants for approval by Engineer of Record or authorized representative before excavating plant locations.
5. If underground construction, utilities, obstructions, or rock are encountered in excavation of plantings, secure alternate locations from Engineer of Record or authorized representative. Make said changes without additional compensation.
6. Installation of native upland plants in the soil shall include pushing soil back away from the installed plant such as to form a "watering bowl" around the circumference of the installed plant. After the plant has been placed into its hole, the CONTRACTOR shall carefully pack soil around the installed plant and form the earthen watering bowl. For upland plants, soils shall be sufficiently watered ( $\geq 3$  gallons) and packed to eliminate air pockets.
7. Shrub and ground cover beds: Plant shrubs and ground covers used in mass plantings in individual holes of required size.
8. Each installed upland plant shall be watered with at least three ( $\geq 3$ ) gallons, with the intent that soil packing and watering will minimize air pockets around plant roots.
9. Staking: Stake trees only as necessary as detailed on Drawings or in accordance with Nursery Standards. If trees are not in peril of falling over, no staking will be necessary. With proper installation of transplanted sabal palm trees, staking is not anticipated to be necessary.
10. Remove dead or damaged branches.

11. Furnish and supply all other material including water and accessory items as may be required to facilitate the planting and establishment of all plants specified to be installed, noting that no additional watering should be necessary for intertidal plants.
12. If sabal palm trees (a.k.a. cabbage palms [*Sabal palmetto*]) are identified for transplant on site ( $\geq 6'$  above ground trunk height required), the following criteria apply. The trees average approximately 6–15 feet in height and are scattered among existing upland communities (areas targeted for excavation of new wetlands). The trees typically will be able to be transplanted within 50-300 feet of their original location. CONTRACTOR shall excavate to a depth that upon backfill and compaction, the tree will be supported in an upright position without use of additional bracing. To ease transplant shock, the fronds of each tree should be trimmed, leaving the center growth bud intact and uninjured. After transplant, each tree must be watered with at least 15 gallons of freshwater around the complete base of the tree to help insure plant survival, and CONTRACTOR will be responsible for watering events as required after transplanting to insure survival for an initial ninety (90) day establishment period. Each transplanted tree will be marked with flagging tape (color/pattern to be decided) for future reference.
13. For each installed upland plant (excluding transplanted sabal palm trees), the CONTRACTOR shall stake a three-quarters to one inch (3/4-1") diameter white PVC pole adjacent to each installed plant; the pole shall be installed at least six (6) inches into the soil and have at least four feet (4') of pole above the ground for easy visibility. The white PVC poles will be used for easy reference to locate installed plants for monitoring and maintenance events.

### 3.03 MAINTENANCE AND REPLACEMENT

#### A. General:

1. Begin maintenance of planted areas immediately after each portion is planted and continue until final acceptance or for a specific time period as stated below, whichever is the longer.
2. The CONTRACTOR shall guarantee the survival of at least ninety (90) percent of all plant materials per species for a period of 90 days from date of installation; supplementary watering may be necessary to insure survival of the installed plants at no additional cost to the DISTRICT. Plants per species that die in excess of the 10% allowance shall be replaced and maintained by the CONTRACTOR at no additional cost to the DISTRICT. A mutually agreeable time clock will be determined between the CONTRACTOR and the Engineer of Record or authorized representative.
3. Maintenance includes but is not limited to watering when necessary, removing dead or dying branches, removing sprouts and suckers; tightening, and repairing or replacing stakes, and weeding plant beds and pits.
4. The CONTRACTOR shall clean up and remove from the premises all surplus and discarded materials and rubbish.
5. Protection of new materials:
  - a. Provide barricades, coverings or other types of protection necessary to prevent damage to existing improvements indicated to remain. Repair and pay for all damaged items.
  - b. Replace unacceptable materials with materials and methods identical to the original specifications unless otherwise approved by the Engineer of Record or authorized representative.

#### B. Plant Establishment and Maintenance Period:

1. Commencement:
  - a. Upon completion of the last day of the planting operation, the plant establishment period for maintaining at least 90% of installed plant material per species in a healthy growing condition shall commence and shall be in effect for ninety (90) days (inclusive of sabal palm transplants, as noted above). Written calendar time period shall be furnished for the plant establishment period. Plants will be provided supplementary watering as necessary (at no additional cost to the DISTRICT) to insure the plant's survival during the 90-day establishment period.
  - b. Engineer of Record or authorized representative will review completed planting for acceptability of installation. Approval of planting denotes initial acceptance and the beginning of the maintenance period.
2. Maintenance and Establishment Period:
  - a. The CONTRACTOR will provide quarterly maintenance of all the plantings for three (3) years after the date of the DISTRICT'S final acceptance of the whole Project (not counting the ninety (90) day establishment period), keeping all project areas > 95% free of nuisance and non-native plants (e.g., mowing, physical removal and/or herbicide) that could threaten the survivorship, growth, and maturation of the installed and extant native plants. Maintenance areas include the total Project footprint. Little to no maintenance is expected for intertidal areas, while transitional, upland, and freshwater habitats are expected to require maintenance.
  - b. CONTRACTOR will be required to visit and maintain the Project site on at least a quarterly basis during the three-year period. The time clock will commence upon DISTRICT acceptance of completion of construction of the whole Project. The intent of plant maintenance is to minimize non-native and nuisance plant growth and maximize survivorship, growth, and maturation of the upland/wetland ecosystem of the Project site. For accessible areas (i.e., top of bank adjacent to intertidal and freshwater wetlands) site mowing will be used as a maintenance tool, with mowing to occur at least twice a year; mowing is envisioned to be required during late spring/early summer and then during early-mid fall seasons. When mowing, the CONTRACTOR will avoid the installed native plants as well as already-in-place native species scattered over the area. Other than non-native plant control, the intent of the mowing is to minimize growth of nuisance vegetation (e.g., dog fennel) that could inhibit the growth and maturation of the native upland ecosystem of the project site. The CONTRACTOR should strive to perform maintenance activities prior to non-native and nuisance plants setting/releasing seed. Nuisance and non-native plants include but are not limited to : Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina* spp.), cattail (*Typha* sp.), torpedo grass (*Panicum repens*), primrose willow (*Ludwigia peruviana*), women's tongue (*Albizia lebbbeck*), cogon grass (*Imperata* spp.), white leadtree (*Leucaena leucocephala*), tropical soda apple (*Solanum viarum*), air potato (*Discorea bulbifera*), women's tongue (*Albizia lebbbeck*), castor bean (*Ricinus communis*), natal grass (*Rhynchelytrum repens*), dogfennel (*Eupatorium capillifolium*), morning glory (*Impomoea* spp.), carrot wood (*Cupaniopsis anacardiodes*), danglepod (*Sesbania herbacea*), para-grass (*Brachiaria mutica*), and guinea grass (*Panicum maximum*).
  - c. The CONTRACTOR shall be responsible for the labor and materials to replace existing and installed desirable vegetation that may be damaged during maintenance and watering events.

- d. The DISTRICT reserves the right to install additional upland and/or wetland plants throughout the Project site. Unless installed by the CONTRACTOR, the CONTRACTOR will bear no responsibility for any supplemental plants installed by others other than nu injuring/killing the additionally installed plants.

END OF SECTION

SECTION 02920 SODDING

**PART 1 - GENERAL**

1.01 SCOPE:

- A. This section generally defines CONTRACTOR's responsibilities, unless otherwise indicated, for the following:
  - 1. Preparation of subsoil
  - 2. Placing topsoil
  - 3. Sod installation
  - 4. Maintenance
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 02402 – Bypass
  - 2. SECTION 02486 – Grassing
  - 3. SECTION 02930 – Landscaping.

1.02 REFERENCES:

- A. FDOT - Florida Department of Transportation - Standard Specifications for Road and Bridge – 2004 (Section 575)

1.03 SUBMITTALS:

- A. Submit sod certification for grass species and location of sod source.

1.04 QUALITY ASSURANCE:

- A. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Florida.
- B. Installer: Company approved by the sod producer.
- C. Sod: Minimum age of 18 months, with root development that will support its own weight, without tearing, when suspended vertically by holding the upper two corners.
- D. The DISTRICT reserves the right to test, reject or approve all materials before application.

1.05 REGULATORY REQUIREMENTS:

- A. Comply with regulatory agencies for fertilizer.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products to site under provisions of SECTION 01600.
- B. Store and protect products under provisions of SECTION 01600.
- C. Sod:
  - 1. Deliver sod on pallets. Protect exposed roots from dehydration.
  - 2. Do not deliver more sod than can be laid within 48 hours.



- D. The CONTRACTOR shall furnish the DISTRICT invoices of all materials received in order that the minimum application rate of materials may be determined.

1.07 MAINTENANCE SERVICE:

- A. Maintain sodded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.

1.08 WARRANTY:

- A. The MANUFACTURER shall warrant the EQUIPMENT, MATERIALS and PRODUCTS specified in this section against defective materials and workmanship with the MANUFACTURER'S standard warranty, but for no less than one year from the date of Final Completion, and as described in the contract documents.
- B. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Final Completion and as described in the contract documents.

**PART 2 - PRODUCTS**

2.01 MATERIALS:

- A. Sod:
  - 1. The sod shall be Argentine Bahia or a native species of sod, including Paspalum vaginatum cultivar, to closely match existing as directed, with well matted roots.
  - 2. The sod shall be commercial size rectangular measuring 12-inches by 24 inches or larger.
  - 3. The sod shall be sufficiently thick to secure a dense stand of live grass, with a minimum thickness of 2-inches.
  - 4. The sod shall be live, fresh, free of pernicious weeds, and uninjured at the time of planting.
  - 5. The sod shall have a soil matt of sufficient thickness adhering firmly to the roots to withstand all necessary handling and be reasonably free of weeds and other grasses.
  - 6. The sod shall be planted as soon as possible after being harvested, and shall be shaded and kept moist from the time of harvesting until it is planted.
  - 7. The source of the sod may be inspected and approved by the DISTRICT prior to construction
- B. Topsoil:
  - 1. Excavated from site and free of weeds.
- C. Water:
  - 1. Clean, fresh, and free of substances or matter which could inhibit vigorous growth of grass.

2.02 FERTILIZING: Not Used

2.03 LAYING SOD:

- A. Moisten prepared surface immediately prior to laying sod.
- B. Lay sod tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.
- C. Peg sod at locations where sod may slide, as required in the drawings, and as directed by the DISTRICT.

D. Roll sod using a lightweight turf roller to provide a true and even surface.

2.04 MAINTENANCE:

A. Water all newly grassed areas once a week to prevent grass and soil from drying out.

B. Immediately replace sod in areas which show deterioration or bare spots.

C. CONTRACTOR shall include in pricing, water and equipment to insure adequate survival of the sod in accordance with this section.

END OF SECTION

SECTION 02930 LANDSCAPING

**PART 1 - GENERAL**

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall provide all labor, equipment and materials for the landscaping with Florida native plant species as required, shown and specified.
- B. The following specification sections may be related to the WORK. This list is not intended to be all-inclusive.
  - 1. SECTION 01300 – Submittals
  - 2. SECTION 02114 – Tree Removal
  - 3. SECTION 02436 – Environmental Protection
  - 4. SECTION 02486 – Grassing
  - 5. SECTION 02920 – Sodding

1.02 APPLICABLE PUBLICATIONS:

- A. The following Standard Specifications shall apply to the work of this section as indicated.
  - 1. Florida Department of Agriculture and Consumer Services
    - a. Grades and Standards for Nursery Plants/Division of Plant Industry, 2015
  - 2. Florida Nursery, Growers, and Landscape Association approved planting practices
  - 3. Florida Department of Transportation
    - a. Standard Specifications for Road and Bridge Construction (FDOT), latest edition
  - 4. American Joint Committee on Horticultural Nomenclature
    - a. Standardized Plant Names, Species, Etc., 1942 Edition
  - 5. American National Standards Institute (ANSI)
    - a. A300 guidelines

1.03 DEFINITIONS: (Not Used)

1.04 SUBMITTALS: The CONTRACTOR shall make submittals in accordance with Section 01300 and the following requirements.

- A. Submit a written schedule of sources or suppliers of all materials for inspection and approval by the DISTRICT before they are delivered and installed on the project. Color photographs of plant material shall be submitted, if requested.
- B. A sample and analysis of mulch before the material is delivered and installed on the project.
- C. Shop drawings for all staking and guying methods to be used if the ones indicated in the Contract, Plans, Specifications, or other referenced documents are not to be implemented or there are no details provided.
- D. If requested, provide a schedule of spraying, dusting materials or insecticide soaps to be used to control pests and disease infestation, the reason for their use, and the method to be used to apply the materials and the method of application before it is delivered and used on the project. Furnish documentation

that the implementation of these control measures for pests and disease infestation is in strict compliance with all applicable regulations.

- E. When the specified type, grade, quality, size, quantity, etc. of a material is not available, the CONTRACTOR shall submit a written request to the DISTRICT for a substitution, along with written, documented proof that the material is not available. All substitutions considered must be Florida native species appropriate for the planting area. Before they are installed, all substitutions shall receive the approval of the DISTRICT.

1.05 QUALIFICATIONS: The CONTRACTOR shall ensure that personnel handling planting chemicals are appropriately licensed to do so and that the application of such chemicals is in compliance with the manufacturer's printed literature and/or directions on the label.

1.06 RESPONSIBILITIES:

- A. The CONTRACTOR shall be responsible for receiving, storing, maintaining (before and after planting), planting soil, mulch, water, temporary irrigation system, miscellaneous landscape accessories, bracing, etc.
- B. The CONTRACTOR shall provide all plants required to perform the work covered by this section, including all shrubs and trees. All shrubs, trees, and groundcovers other than sod shall be Florida native plants, unless otherwise specified in the Contract Documents.
- C. The Drawings represent a schematic layout depicting the limits of the different plant species, and other typical details pertinent to the project. The DISTRICT may make adjustments to the final location of the plants. The DISTRICT reserves the right to adjust the number and locations of the designated types and species to be used at any of the locations shown.
- D. The CONTRACTOR shall be responsible for making site subsurface investigations and examinations as he or she chooses in order to become familiar with the construction conditions under which the work will be performed.
- E. Work Covered by Contract Documents: The CONTRACTOR shall provide all supervision, labor, materials, equipment, and tools, and perform all operations necessary to excavate, grade, plant, and backfill all landscape material indicated in the Drawings.
- F. The CONTRACTOR shall procure all necessary permits to accomplish all of the work.
- G. The CONTRACTOR is responsible for performing all work in accordance with all applicable regulations, ordinances, and code requirements from the appropriate city, county, state and/or federal jurisdiction the project is located in.

1.07 CERTIFICATIONS: The CONTRACTOR shall provide certifications for indicating that the plants used in the WORK meet or exceed the requirements of the specifications. As a minimum, the certifications shall indicate that the plants comply with the grade, size, and quality of the planting material specified or shown and that the plants are Florida native landscaping materials, unless otherwise specified.

1.08 INSPECTION COORDINATION: The CONTRACTOR shall provide access to the WORK for the DISTRICT as requested for inspection. The Contractor shall provide 48 hours notice of its intention to begin new WORK activities.

1.09 WARRANTY: The CONTRACTOR shall warrant plantings and landscaping in accordance with the following.

- A. All plants shall be of the same grade and standard, as set forth in the latest revision of the "Florida Grades & Standards for Nursery Plants", at the end of the warranty period as they were originally specified prior to installation.

- B. Upon completion of the last day of planting operation and acceptance of the planting by the District, the plant establishment period will commence. The Contractor is responsible for a minimum survival rate of 90 percent for all installed plant material per species for a period of 90 days. Contractor is responsible for watering as necessary to insure the plant's survival.
- C. An inspection will be made at the end of the 90-day plant establishment period to determine the status of landscape elements and plant materials. Maintenance in accordance with Section 02940 will commence after acceptance of the 90-day plant establishment period.
- D. Existing Plant material, which is on site and scheduled to be transplanted or placed into nursery pots, is not covered by a warranty except in the case of the CONTRACTOR's negligence or work that has been done in an unworkman-like manner. If it is determined by the DISTRICT in its sole discretion that the CONTRACTOR's negligence or unworkman-like operations has severely damaged, or poses a threat to, the health of material to be transplanted or already transplanted, then the CONTRACTOR shall be responsible to replace the plant(s) per original Specifications or an equal replacement.
- E. Warranty replacement may be required for defective landscape elements and plant materials caused by:
  - 1. Girding trunk and limbs
  - 2. Breaking limbs so as to deform tree
  - 3. Failure to water plants upon initial installation
  - 4. Allowing trees to dry out during the transplant procedure or after installation during the required watering period
  - 5. Providing improper bracing
  - 6. Excessive pruning beyond that approved by the DISTRICT or state/national horticultural standards
  - 7. Installing plant at improper planting depth
  - 8. Inadequate root development for the stock size.
  - 9. Overdeveloped roots or root-bound conditions for containerized stock
- F. The warranty shall become null and void for plant material which is damaged or dies as a result of "Acts of Nature" limited to hail, freeze, lightning, winds that exceed hurricane force, lethal yellowing or any other non-preventable and incurable plant diseases, provided that the plant was in a healthy growing condition prior to these "Acts of Nature".
- G. If replacement plant material that meets the requirements of size, quality, and grade cannot be found the CONTRACTOR shall notify the DISTRICT, who will recommend one of the following courses of action:
  - 1. Do not replace the material, or if the plants have not yet been installed, do not install them. Full credit for plant cost, including installation, based on the proposal values, will be given to the DISTRICT.
  - 2. Delay installation of the plant material until material that meets the specifications is available.
  - 3. Accept smaller sizes of the native plant material specified, and negotiate any fee adjustment prior to installation.
- H. The warranty of plant material shall be construed to mean the complete and immediate replacement of plant material within seven (7) calendar days if:
  - 1. It is not in a healthy growing condition and thus renders it below the minimum quality indicated in the Specifications (Florida #1 or Wetland Grade).

2. There is a question as to its ability to survive after the end of the guarantee period that would render it below the minimum quality indicated in the Specifications (Florida #1 or Wetland Grade).
  3. It is dead.
- I. The seven (7) calendar days may be extended due to seasonal conditions, availability, preparation time such as root pruning, etc., only if approved by the DISTRICT in advance.
  - J. Size, Quality and Grade:
    1. Provide replacement of the same species of equal size and quality as the damaged plant.
    2. If an equal-sized plant cannot be found, then other methods of compensation shall be determined in negotiation with the DISTRICT. They may include, but not be limited to:
      - a. Replacement with plant(s) of another species of same size as original plant
      - b. Replacement with more than one plant to equal the canopy, trunk diameter, or overall height
      - c. Payment in lieu of replacement, with value determined by "replacement" value
    3. Replacements shall be guaranteed for a period equal to the originally specified warranty and shall begin again at time of acceptable replacement.
    4. The CONTRACTOR or its designated landscaping provider shall be responsible for watering the replacement upon installation and as required for sixty (60) calendar days after planting.

## **PART 2 - PRODUCTS**

- 2.01 PLANT GRADE: Any supplier of materials misrepresenting the grade or quality of their materials (i.e., a higher grade than they actually are) as determined by the DISTRICT, shall not be allowed to supply any material for the project. All material already supplied and received from such a supplier shall be removed and replaced at the CONTRACTOR's sole cost. This requirement for removal and replacement shall also include any installed materials. No further materials will be accepted from such supplier until written evidence is submitted and confirmed that all material for delivery is of the grade or quality represented.
- 2.02 NOMENCLATURE: The CONTRACTOR shall supply plant material conforming to the names given in Standardized Plant Names, Species, Etc., 1942 Edition, prepared by the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein shall conform generally with names accepted in the nursery trade.
- 2.03 GRADE STANDARDS: The CONTRACTOR shall furnish plant material nursery grown Florida native species and shall comply with all required inspections, grading standards and plant regulations as set forth in the latest edition of the Florida Department of Agriculture and Consumer Services Division of Plant Industry manual "Grades and Standards for Nursery Plants" or with any superseding specifications that may be called out on the plans. All listed wetland plant species at stock sizes qualifying under the FDACS 'wetland grade' category shall meet the requirements for that grade. All combinations of plant species and stock sizes not listed as wetland plants, or otherwise not listed in the "Grades and Standards for Nursery Plants" shall conform to Florida No. 1 as to: (1) health and vitality; (2) condition of foliage; (3) root system; (4) freedom from pest or mechanical damage; and (5) heavily branched and densely foliated according to the accepted normal shape of the species.
- 2.04 PLANT DESIGNATIONS: The CONTRACTOR shall furnish plants as designated on the Drawings and conforming to the following.
  - A. Any Container Grown (CG) plants that have become root bound or which the foliar system is out of proportion (larger) to the size of the container will not be accepted.

1. With metal containers, unless the root ball system slips easily and unbroken from the can, a nursery can-cutter shall be used to slit the can in such a way that the can may be opened fully.
  2. CG plants shall not be removed from the container until immediately before planting and with all due care to prevent damage to the root system.
- B. Collected Plants: When collected plants are proposed, the DISTRICT shall be given at least two days' written notice before the digging to allow the DISTRICT the opportunity to inspect the plants prior to digging. Included in this written notice shall be a copy of the appropriate permits secured from the Florida Department of Agriculture for the collected plants. Collected plants shall be dug with a root spread at least 10 percent greater than nursery grown plants of the same species and size. No collected plant shall be planted prior to the DISTRICT's approval and inspection.
- C. Specimen Plants (Florida Fancy): When specimen or Florida Fancy plants are specified, they will be labeled as such on the Plans.
- D. Grade: Except for FDACs wetland plants or where another grade is specifically called for in the Contract and/or Plans, all plant material shall be Florida No. 1, or better, at the time of installation, final acceptance, and at the end of the guarantee period.
- E. Habit of Growth: All plant material shall have a habit of growth that is normal for that species and shall be sound, healthy, vigorous, and free from insects, plant diseases, and injuries.
- F. Measurement of Trees, Palms, Shrubs, and Ground Cover:

1. Trees, Shrubs, and Ground Cover:

- a. Root ball: Requirements for the measurement of root ball diameter and depth shall comply with requirements as set forth in the latest edition of the Florida Department of Agriculture and Consumer Services' (Division of Plant Industry) manual "Grades and Standards for Nursery Plants":

<u>CALIPER (in.)</u>	<u>MIN. BALL DIA. (in.)</u>	<u>MIN. BALL DEPTH (% of diameter)</u>
1.00" - 1.50"	16"	75% of dia.
1.50" - 1.75"	20"	65% of dia.
1.75" - 2.00"	22"	65% of dia.
2.00" - 2.50"	24"	65% of dia.
2.50" - 3.50"	26"	65% of dia.
3.50" - 4.00"	28"	65% of dia.
4.00" - 4.50"	30"	60% of dia.
4.50" - 5.00"	32"	60% of dia.
5.00" - 5.50"	34"	60% of dia.
5.50" or more increase in proportion up to 48",		60% of dia

Then decrease in proportion for larger size diameter.

- b. Height: The height of plant material shall be measured from finished grade and continue up to where the main mass of the plant uniformly ends. The height shall not include any singular or isolated parts of the plant, such as leaves, shoots, branches, limbs, or fronds that extend out beyond the main mass of the plant.
- c. Width: The width of plant material shall be measured from one side of where the main mass uniformly ends and continue to the other side of where the main mass of the plant uniformly ends. The width shall not include any singular or isolated parts of the plant, such as leaves, shoots, branches, limbs, or fronds that extend out beyond the main mass of the plant.
- d. Caliper: The caliper of tree trunks shall be measured 3' above the ground unless:
- i. The landscape regulations, ordinances, and code requirements from the appropriate local jurisdiction the project is located in, indicate another method of measurement.

- ii. Another method of measurement is indicated otherwise on the Plans.
  - iii. Palms: Requirements for the measurement of clear trunk, clear wood, greywood, root ball diameter, and depth shall comply with requirements as set forth in the latest edition of the Florida Department of Agriculture and Consumer Services' manual "Grades and Standards for Nursery Plants".
- G. All sizes shown for plant material on the Plans are to be considered as minimums. All plant material must meet or exceed these minimum requirements for height, spread, etc. as indicated on the Plans. When plant sizes are specified as a range of size, installed material shall average the mean of the range specified.

2.05 PLANTING SOIL:

- A. General Type: The CONTRACTOR shall plant all new transplanted plant material (other than sod) with the general type planting soil, unless otherwise stated. The planting soil shall be the stockpiled topsoil or existing embankment fill as contoured. The soil shall be thoroughly mixed and delivered in a loose, friable condition.
- B. Soil for Backfilling Root-Pruning Trenches: The CONTRACTOR shall backfill root-pruning trenches with a soil mixture consisting of by volume of 70 percent planting soil as described in 2.05A above and 30 percent mulch with 0-0-20 fertilizer added at a rate of 1/3 pound per cubic yard of soil, thoroughly mixed prior to backfilling.
- C. The CONTRACTOR shall submit sample of sand and muck separately and/or soil analysis(es) if requested and as needed.

2.06 FERTILIZER: Not Used

2.07 INSPECTIONS:

- A. Inspection at the growing site does not preclude the right of rejection at the project site.
- B. The CONTRACTOR shall request inspections in writing at least 48 hours in advance.
- C. In the event the DISTRICT has made an early inspection shall not bar the DISTRICT from subsequently rejecting such work that is discovered to be faulty work or work omitted or work performed which is not in accordance with the contract requirements.
- D. Die-Back and Leaf-Drop: Plant material showing signs of die-back or leaf-drop will not be accepted and must be removed from the project immediately if so directed by the DISTRICT. Any plant material with tendencies toward leaf-drop or die-back must be root pruned early enough to provide a sound network of hair roots prior to relocation.
- E. Mechanical Destruction of Foliage: Mechanical destruction of foliage resulting from root pruning shall not affect more than 10 percent of the total foliage prior to planting on the project. Loss of foliage caused by seasonal change will be accepted.
- F. Spanish Moss: If Spanish Moss (*Tillandsia usneoides*) exists on plant material, it shall be completely removed prior to planting on the project.
- G. Chlorosis: The allowable level of Chlorosis in foliage shall be set forth in the latest edition of the Florida Department of Consumer Services' manual, "Grades and Standards for Nursery Plants".
- H. Plant material shall not be accepted when the ball of earth surrounding its roots has been cracked, broken, or otherwise damaged.
- I. The CONTRACTOR shall, when necessary, perform root pruning of plant material conforming to guidelines provided by an arborist or certified landscape professional to ensure the health, stability and



longevity of the plant material. Prior to root pruning, the CONTRACTOR shall give 48 hour advance notice to the DISTRICT advising of the date to root prune any plant material. This shall allow for any inspections during or after the root pruning, if necessary.

**2.08 DELIVERY, HANDLING, STORAGE AND SUBMITTALS:**

- A. Delivery and Handling: The CONTRACTOR shall comply with the following regarding delivery, handling, and storage of planting materials.
  - 1. Movement of nursery stock shall comply with all Federal, State, and local laws, regulations, ordinances, codes, etc.
  - 2. The CONTRACTOR shall be responsible for protecting plant material from adverse environmental conditions including drying and sunburn during all phases of delivery and storage. Further, the CONTRACTOR shall be responsible for protecting plant material from any damage, theft, or deterioration of health or appearance during all phases of delivery and storage.
  - 3. Transport materials on vehicles large enough to allow plants not be crowded and damaged. Plants shall be covered to prevent wind damage during transit.
  - 4. Protect plant material during shipping to prevent damage to the root system and desiccation of leaves. Trees shall be protected during shipping by tying in the branches and covering all exposed branches as necessary. Do not bend or bind-tie plant material in such a manner as to damage bark, break branches, or alter the natural shape.
  - 5. The CONTRACTOR shall exercise care in handling, loading, unloading, storing, and transporting all material to prevent damage. The CONTRACTOR shall assume full responsibility for protection and safekeeping of materials.

**2.09 DAMAGE TO EXISTING VEGETATION AND/OR IRRIGATION:**

- A. The CONTRACTOR shall exercise caution when working in the vicinity of existing vegetation and/or irrigation system components to prevent damage caused by the use of tools or equipment (mechanical), chemicals, grade changes, and excavation.
- B. If the CONTRACTOR damages existing plants and/or vegetation due to his own negligence, he shall be responsible to replace them at his cost, within seven calendar days.
- C. If tree damage results when the CONTRACTOR employed the appropriate preventive measures, those damages may, at the discretion of the DISTRICT, be rectified by pruning in conformance with the "American National Standards Institute (ANSI) A300 guidelines" or as directed by the DISTRICT.

**PART 3 - EXECUTION**

- 3.01 The CONTRACTOR shall keep areas free of all trash, debris, loose and excess material, unsecured equipment or tools, etc., which may be subject to theft or vandalism, or which may create a passive or active danger to the safety of the public or an unnecessary eyesore.
- 3.02 The CONTRACTOR shall carefully inspect all plants delivered to the site to verify that they meet the requirements of the Contract as to grading, condition, size, and species. The CONTRACTOR shall reject all plants that do not comply with the requirements.
- 3.03 PREPARATION OF SITE PRIOR TO PLANTING: Before any disturbance of the actual planting areas is performed, the CONTRACTOR and the DISTRICT shall conduct an inspection and evaluation of these sites. On any areas that require sodding and plant installation, the CONTRACTOR shall remove a circular area of sod three to four feet in diameter for trees and field-grown shrubs; and two feet in diameter for three-gallon material. All sod scalped for plant installation shall be removed completely from the area and immediately disposed of off-site.

3.04 TREE AND PLANTS PLANTING PITS: The CONTRACTOR shall prepare planting pits as follows.

- A. Planting pits shall be excavated to the dimensions required to comply with the requirements for soil amendments and to include the following:
  - 1. For one gallon containerized plants, excavate with a hole three inches larger in diameter than the container. Remove container prior to planting.
  - 2. Stabilize excavations for trees and shrubs with water and allow to percolate out before planting.

3.05 TREE AND PLANTS PLANTING: The CONTRACTOR shall plant trees and plants in accordance with industry standards and as follows.

- A. Set container grown stock on a six-inch (minimum thickness) layer of compacted planting soil mixture, plumb and in center of pit, with top of ball at same elevation as adjacent finished landscape grades. Remove container from root balls. Set plants in pits at such level that after settlement they bear the same relationship to the finished grade of the surrounding ground as they did in their natural state. Place backfill around base and sides of ball and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately one half full, water thoroughly. Repeat watering until no more is absorbed. Water again after placing final layer of backfill. Flush amended soil mixture into place with a slow full hose stream eliminating all air pockets and fill pit to form a broad saucer to surrounding grade.
- B. In uplands, provide additional backfill berm around edge of excavations to form a shallow planting saucer to contain water with a minimum of three to five inch berm.

3.06 PRUNING AND REPAIR: The CONTRACTOR shall limit pruning to the minimum necessary to remove dead or injured twigs and branches. The CONTRACTOR shall prune so as not to change the natural habit or shape of the plant, not shall the CONTRACTOR prune any plant back to such an extent that it no longer meets specifications.

END OF SECTION

## SECTION 02940

### NON-NATIVE VEGETATION REMOVAL AND CONTROL

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. The work included under this section consists of mechanical and selective removal and/or treatment of non-native (exotic) plant species including nuisance vegetation within the project limits not associated with standard clearing & grubbing of project grading areas as depicted in the Drawings. Also described in this section will be the re-removal and treatment of non-native and nuisance vegetation that shall occur (re-sprout) following initial clearing and grubbing, mechanical clearing, and/or hand removal efforts during the warranty and maintenance period.
- B. Non-native and nuisance plants may include, but are not necessarily limited to: Brazilian pepper (*Schinus terebinthifolia*), Australian pine (*Casuarina* spp.), punk tree (*Melaleuca quinquenervia*), carrotwood (*Cupaniopsis anacardioides*), white leadtree (*Leucaena leucocephala*), air potato (*Dioscorea bulbifera*), torpedo grass (*Panicum repens*), Peruvian primrosewillow (*Ludwigia peruviana*), castor bean (*Ricinus communis*), sesbania (*Sesbania punicea*), women's tongue (*Albizia lebbbeck*), cogon grass (*Imperata* spp.), paragrass (*Utrichloa mutica*), natalgrass (*Rhynchelytrum repens*), guineagrass (*Panicum maximum*), and those species listed in the Florida Exotic Pest Plant Council's (FLEPPC) 2017 List of Invasive Plant Species category 1 and 2.

##### 1.02 QUALITY ASSURANCE

###### A. Referenced Standards:

"Control of Non-Native Plants in Natural Areas of Florida", K. A. Langeland and R. K. Stocker, Florida Cooperative Extensions Services, Institute of Food and Agricultural Sciences, University of Florida.

Florida Pesticides Laws and Rules, Chapter 487, Florida Statutes, Florida Department of Agriculture and Consumer Services, June 1986.

Use products found on the following website; [www.flpesticide.us/](http://www.flpesticide.us/), that are approved by the Florida Department of Agriculture for the State of Florida. The use of restricted products is prohibited.

2017 Florida Exotic Pest Plant Council (FLEPPC) or most recent

##### 1.03 SUBMITTALS

- A. Shop Drawings: See Section 01300.
- B. Product technical data including:
  - a. Acknowledgement that products submitted meets the requirements of standards referenced. Manufacturer's use instructions.
  - b. Other documents:
    - 1. Prior to delivery of materials, certificates of compliance attesting that materials meet specified requirements shall be provided. Certified copies of the material certificates shall include the classification, botanical name, common name, size, quantity by species, and location where grown.
    - 2. Maintenance Record detailing maintenance activities and chemical applications in accordance with the contract documents and DISTRICT NPDES reporting.

##### 1.04 PRODUCTS

### NON-NATIVE VEGETATION REMOVAL AND CONTROL

#### A. SAFETY AND HANDLING

- a. A schedule indicating the dates of proposed herbicide maintenance shall be provided at least 10 calendar days prior to the first maintenance event.
- b. Comply with Referenced Documents and manufacturer's recommendations for delivery, storage and handling of herbicides.
- c. Use licensed, suitably trained and experienced workers to handle, mix and apply herbicides. Workers shall be under the direct supervision of a person which holds a valid and current Pesticide Applicators certification with a Natural Areas and Aquatic Endorsement
- d. Comply with applicable and suitably experienced workers to handle, mix and apply herbicides.
- e. Comply with safety recommendations in the Reference Documents and applicable laws and regulations.

#### B. HERBICIDE

- a. Refer to species-specific product recommendations in reference documents and to labeling restrictions. Herbicides must be pre-approved by the DISTRICT Representative for specific location and application methods, as different herbicides may be appropriate for differing non-native vegetation. The use of herbicides and products approved by the FDA/EPA for use in aquatic sites is required for all applications in wetlands or surface water areas.

#### C. PRODUCTS – SPECIAL PROJECT WARRANTY

- a. The Contractor shall maintain all areas within the project limits free of non- native and, as needed, nuisance plants, for the maintenance period, on a quarterly basis.

### PART 2 - EXECUTION

#### 2.01 GENERAL

- A. Comply with recommendations in Referenced Document for mechanical removal.
- B. Comply with this section, Referenced Document and manufacturer's recommendations for herbicide application and follow up. Use herbicide, vehicles and solution specified in this Section.
- C. Provide notification at least two weeks prior to quarterly maintenance event.
- D. Submit maintenance report and request inspection of maintenance work.

#### 2.02 HERBICIDE APPLICATION

- A. Apply herbicide to non-native and nuisance plant shoots seedlings, rhizomes and sprouts recurring 30 days after mechanical removal and/or hand removal. Retreat 60 days after initial application. Use minimal concentrations necessary to control re-growth and/or cause death. Use in all cleared areas for re-growth of non-native plants as appropriate. All herbicides must be dye-laced to allow and assist with visual verification of spraying; the dye color must be mutually agreeable to the Contractor and the DISTRICT Representative.
- B. Care shall be taken to avoid application or spray drift of herbicides to native vegetation or accidental spillage in any location.
- C. Apply 3 treatments of herbicide 60 days apart to all live nonnative and nuisance plants remaining within the work area. Treat so there are no, live non-native plants 60 days after the third application. Treat with a fourth application, if necessary. Use in all areas inside the limits of the Work.

## 2.03 DISPOSAL OF WOODY DEBRIS

- A. The disposal of timber, stumps, brush, roots, rubbish and other similar vegetative material resulting from non-native/nuisance plant removal activities shall be by methods approved by the DISTRICT Representative and in accordance with all applicable laws, ordinances and regulations. The Contractor shall take ownership of all such material and is responsible for all costs, permitting etc. regarding disposal of such materials whether onsite or offsite.
- B. The standing biomass removed may not be mulched in place. In general, disposal of woody vegetation in wetland areas shall be by stockpiling and removing from the project location or burning in an approved air-curtain device within the cleared wetland area or in other areas pre-approved by the DISTRICT Representative in conformance with industry safety standards and methods, including obtaining required permits and approvals pursuant applicable laws, regulations and ordinances. No mulching or disposal in wetland or upland areas will be permitted.

END OF SECTION